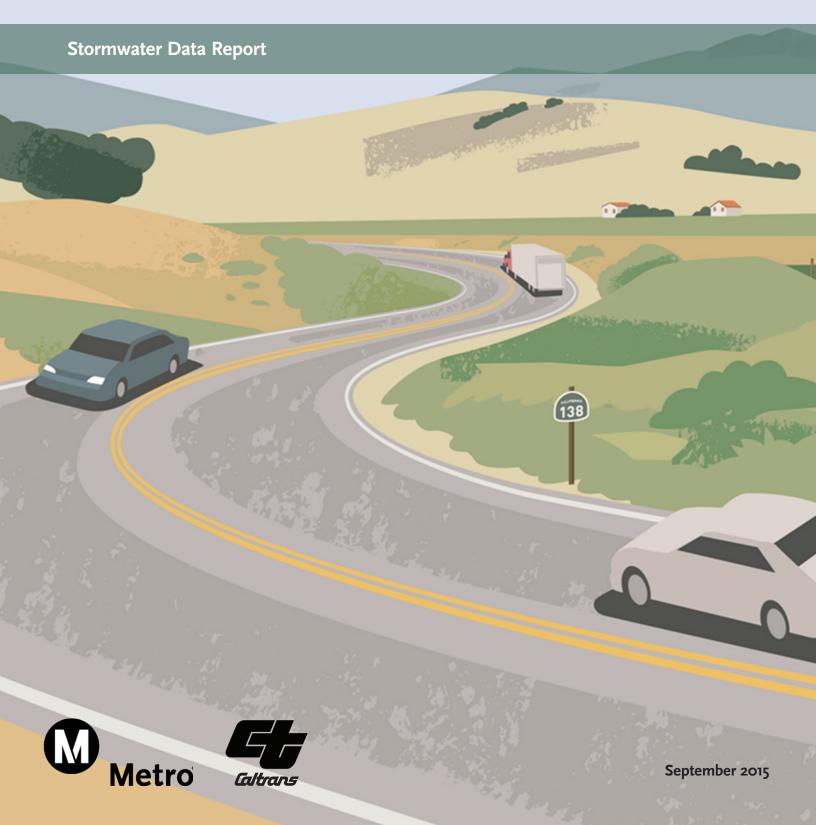
Northwest 138 Corridor Improvement Project



	Dist-County-	Route: <u>07-LA-1</u>	L38 07-LA-	5 07-LA-14			
	Post Mile Li	mits: 0.0/36.8	(SR-138) 7	9.5/83.1(I-5) 73.4	4/74.4(SR-14)		
	Project Type	: Category 1 –	Conversion	of Conventional Hays/Freeways			
	Project ID (or EA): <u>EA 265100</u>						
		entification: N//					
	Phase:	П	PID				
Caltrans°			PA/ED				
			PS&E				
Regional Water Quality Control Board(s):	Lahontan (Reg	gion 6) and Los	s Angeles (R	egion 4)			
Is the Project required to consider Treatr	ment BMPs?			Yes ⊠	No □		
If yes, can Treatment BMF	es be incorpora	ted into the pro	oject?	Yes ⊠	No □		
If No, a Technica	l Data Report m	nust be submitt	ted to the R	WQCB			
at least 30 days	prior to the proj	ects RTL date.		List RTL Date:	TBD		
Total Disturbed Soil Area: <u>2,347 Acres</u> (<i>A</i>	Alt 1)	Risk Leve	l: 2				
Estimated: Construction Start Date: APR	•		<u> </u>	ion Date: NOV 1 2	025 (Alt 1)		
Notice of Intent (NOI) Date to be submitt							
Erosivity Waiver		Yes □	Date:		_ No ⊠		
Notification of ADL reuse (if Yes, provide	date)	Yes □	Date:		_ No ⊠		
Separate Dewatering Permit (if yes, perm	-	Yes □					
This Report has been prepared under the		_	_		_		
technical information contained herein an	d the date upon	which recomm	endations, c				
based. Professional Engineer or Landscap	e Architect stam	p required at P	S&E.				
Man-San (Vincent) Chio,	S	ujaya Kalainesa	an		Date		
Registered Project Engineer	Ca	altrans Designa	ited Oversigl	nt Representative			
I have reviewed the stormwater quality des	sign issues and i	find this report	to be comple	ete. current and ac	curate:		
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Reza	Fateh, Project N	Manager			Date		
Roge	r E. Castillo, Des	signated Mainte	enance Repr	esentative	Date		
		<u> </u>					
Ron I	Russak, Designa	ated Landscape	Architect Re	epresentative	Date		
		·					
[Stamp Required for PS&E only) Shirle	ev Pak. District/I	Regional Design	n SW Coordii	nator or Designee	Date		
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STORM WATER DATA INFORMATION

1. Project Description

Introduction

The California Department of Transportation (Caltrans), in cooperation with the Los Angeles County Metropolitan Transportation Authority (Metro), propose to widen and improve approximately 36.8 miles of State Route 138 (SR-138) between the Interstate 5 (I-5) interchange and the State Route 14 (SR-14) interchange.

The existing facility is a 2-lane highway that contributes to the local circulation network and provides an alternate route for east-west traffic in northwest (NW) Los Angeles County. The NW SR-138 Corridor Improvement Project (project) would widen SR-138 and provide operational and safety improvements. The project corridor spans east-west approximately 36.8 miles (Post Mile [PM] 0.0 to PM 36.8) in the NW portion of Los Angeles County, just south of the Kern County border.

Project Description

This section describes the proposed action and the project alternatives that were developed to achieve the identified purpose and need of the project while avoiding or minimizing environmental impacts. The alternatives are the No Build Alternative, Alternative 1 (Freeway/Expressway) with or without a design option for a bypass around Antelope Acres, and Alternative 2 (Expressway/ Conventional Highway). SR-138 is an undivided 2-lane highway that travels from I-5 around the south side of Quail Lake and east to SR-14. SR-138 is not a controlled-access facility; access and egress points include at-grade intersections with paved and unpaved roads and driveways. The existing roadway consists of two 12-foot lanes with variable shoulders ranging from 2- to 4-foot paved to 8 foot unpaved non-standard shoulders.

The purpose of the project is to improve mobility and operations in northwest Los Angeles County, enhance safety within the SR-138 Corridor based on future projected traffic conditions, and accommodate foreseeable increases in travel and goods movement within northern Los Angeles County.

The need for the proposed project is derived from foreseeable increases in travel demand that would exceed the current capacity of SR-138 and higher than average state-wide fatal accident rates at several locations.

Alternatives

NO- BUILD ALTERNATIVE

Implementation of the No-Build Alternative would maintain the existing configuration of SR-138 and would not result in improvements to the route. However, additional residential, commercial, and interregional development is anticipated to occur in Antelope Valley in the future. With Los Angeles to the southeast and Bakersfield to the northwest, this area is poised for large-scale growth, which is

anticipated to result in increased traffic demands beyond the capacity of the existing system (Caltrans, 2008).

The No-Build Alternative would not accommodate the projected population growth or expected substantial increase in goods movement truck traffic in Northern Los Angeles County and the existing corridor would not be improved. As discussed in the Project Study Report/ Project Development Study (PSR/PDS), the existing SR-138 corridor is projected to degrade and operate consistently at a Level of Service (LOS) E and F for 2040 conditions (Caltrans, 2008). The No-Build Alternative could result in indirect impacts on air quality, mobility, safety, and the economy within Northern Los Angeles County. There would be increased maintenance costs to maintain the route without any other improvements.

BUILD ALTERNATIVE 1 | Freeway - Expressway

Alternative 1 (Freeway/Expressway) would include a 6-lane freeway from the I-5 interchange connector ramps to County Road 300th Street West , and a 4-lane expressway from County Road 300th Street West to the SR-14 interchange generally following the existing alignment of SR-138. There would also be improvements to the I-5/SR-138 and SR-138/SR-14 freeway connections and structure over the SR-14. Study limits on I-5 are from PM 79.5 to PM 83.1 and on SR -14 the limits are from PM 73.4 to PM 74.4.

BUILD ALTERNATIVE 1 WITH DESIGN OPTION | Antelope Acres Bypass

There is a design option with this alternative to include a bypass route around the Antelope Acres community. This option was developed to reduce the impacts to the existing residences of Antelope Acres due to the proposed four-lane expressway along the existing alignment of SR-138. The alignment would bypass the community to the north along West Avenue C and going from west to east, the alignment would begin to deviate from the existing SR-138 near 100th Street West and continue in a northeasterly direction towards West Avenue C. After paralleling West Avenue C for approximately one mile, the alignment would continue in a southeasterly direction back towards the existing SR-138, and eventually join the existing SR-138 near 70th Street West. The existing highway would be relinquished to the County as a local roadway between 100th Street West and 70th Street West, with additional speed reduction measures proposed to reduce cut-through traffic.

BUILD ALTERNATIVE 2 | Expressway – Conventional Highway

Alternative 2 (Expressway/Highway) would include a 6-lane freeway from the I-5 interchange connector ramps to Gorman Post Road, a 6-lane expressway from the Gorman Post Road interchange to County Road 300th Street West, a 4-lane expressway from 300th Street West to County Road 240th Street West, and a 4-lane limited access Conventional Highway from County Road 240th Street West to the SR-14 interchange, generally following the existing alignment of SR-138. There would also be improvements to the I-5/SR-138 and SR-138/SR-14 freeway connections and the structure over the SR-14. The study limits on these connectors would be the same as Alternative 1; on I-5 from PM 79.5 to PM 83.1 and on SR -14 the limits are from PM 73.4 to PM 74.4.

For Alternative 1 (with or without the Antelope Acres Bypass design option), and Alternative 2, new overcrossings would also be considered at various intersections with local roads including 60th Street West, 90th Street West, 110th Street West, 170th Street West, 190th Street West, 210th Street West, and Three Points Road to enhance traffic safety and improve local vehicular, pedestrian and bicycle circulation.

Note on the TSM Alternative

The TSM Alternative was developed to strategize improvements to the facility without major changes to the overall capacity. This alternative had improvements to the vertical and horizontal roadway alignment in areas that are currently non-standard, shoulder widening, localized improvements at accident locations, intersection improvements, and additional lanes to improve safety and traffic flow at focused areas. Upgrades to signage and lighting were also evaluated to improve safety and operations.

A TSM Alternative was proposed originally as a result of agency and public input during circulation of the Notice of Intent (NOI)/Notice of Preparation (NOP) in 2013 and subsequent public meetings.

The TSM Alternative was studied and evaluated in all of the technical studies for the proposed project but the TSM Alternative was not recommended for further analysis and it was ultimately rejected from further study because it did not fully address the project's purpose and need. For that reason, the TSM Alternative is included in this technical study analysis but not included in the project description seen above. Please refer to the NW SR-138 Draft EIR/EIS for more information on the TSM Alternative.

Disturbed Soil Area and Net Additional Impervious Area

Table 1 summarizes Alternative 1, Alternative 2, and the TSM Alternative Disturbed Soil Area (DSA) and Added Impervious Areas (AIAs), respectively.

Table 1 Project Disturbed Soil Area and Added Impervious Area

Area (ac)	Alternative 1	Alternative 1 Bypass Option	Alternative 2	TSM Alternative
Disturbed Soil Area (DSA)	2,347	2,307	1,889	113
New Impervious Area	451	451	439	50
Existing Impervious Area to be Removed	37	26	37	0
Net Added Impervious Area (AIA)	414	425	402	50

The estimated DSA includes areas of native soil and fill that would be disturbed by the proposed improvements in each of the build alternative. The DSA was calculated by subtracting the existing impervious area from the proposed total construction area, including staging areas. The estimated

new impervious area includes all new pavement construction for the mainline lanes, shoulders and local streets. The existing impervious areas to be removed includes existing pavement that would need to be removed or reconstructed to make way for the proposed improvements, as well as portions of the existing SR-138 that are proposed to be relinquished to the local agency (Cities or Los Angeles County). The net AIA was calculated by subtracting the total existing impervious area intended to be removed from the total new impervious area.

The western end of the project west of Quail Lake, from post mile (PM) 0 to PM 2.4, the project falls within the Los Angeles County Phase 1 Municipal Separate Storm System (MS4) area.

2. Site Data and Storm Water Quality Design Issues (refer to Checklists SW-1, SW-2, and SW-3)

The project is located within the jurisdiction of Caltrans District 7 and within the jurisdictions of the Lahontan Regional Water Quality Control Board (RWQCB) – Region 6 and the Los Angeles RWQCB – Region 4.

Hydrologic Units

The Project is located within two Hydrologic Units (HU): Santa Clara-Calleguas HU on the west (Santa Clara River watershed) and Antelope HU on the east. The details for the hydrologic Units are summarized in **Table 2**.

Table 2 Hydrologic Units within Project Limits

			Hydrologic Sub-	
Project Limits	Hydrologic Unit	Hydrologic Area	Area (HSA)	HSA Number
SR-138 PM 0.0	Santa Clara-	Piru	undefined	403.43
to 2.4	Calleguas			
I-5 PM 79.5 to				
83.1				
SR-138 PM 2.4	Antelope	Neenach	undefined	626.40
to 27.7				
SR-138 PM 27.7	Antelope	Lancaster	undefined	626.50
to 36.8				

Receiving Water Bodies

From PM 0.0 to PM 2.4 on SR-138 and from PM 79.5 to 83.1 on I-5, the project is within the Santa Clara-Calleguas HU and the Piru Hydrologic Area, Sub-Area 403.43. This area discharges to Quail Lake and then to Gorman Creek via Lower Quail Canal, or discharges directly to Gorman Creek. Gorman Creek transitions from a natural channel to a concrete channel before it crosses under I-5

From PM 2.4 to 27.7, the project is within the Antelope HU and the Neenach Hydrologic Area, Sub-Area 626.40. There is no identified water body for this sub-area according to the Basin Plan for the Lahontan Region since the area does not have major surface waters. From PM 27.7 to 36.8 (SR-14),

the project is also within the Antelope HU and the Lancaster Hydrologic Area, Sub-Area 626.50. This area discharges to minor surface waters and/or Amargosa Creek, which eventually to Rosamond Dry Lake in the Mojave Desert.

2010 Integrated Report (Clean Water Act 303(d) List/305(b) Report

The project does not discharge to any impaired water body on the 303(d) list.

Total Maximum Daily Loads (TMDL)

The project limits are within the Santa Clara River, Neenach and Lancaster Watersheds. The Total Maximum Daily Loads (TMDLs) are as follows:

Santa Clara River

Established TMDLs

The Upper Santa Clara River Chloride TMDL, Santa Clara River Nitrogen Compounds TMDL and the Total Maximum Daily Loads for Santa Clara River Estuary/Surfer's Knoll, McGrath State Beach, and Mandalay Beach Coliform and Beach Closures

The Upper Santa Clara River Chloride TMDL, Santa Clara River Nitrogen Compounds TMDL and the Total Maximum Daily Loads for Santa Clara River Estuary/Surfers' Knoll, McGrath State Beach, and Mandalay Beach Coliform and Beach Closures are in effect. Caltrans is not the responsible party for all three TMDLs.

<u>Total Maximum Daily Loads for Indicator Bacteria in the Santa Clara River Estuary and Reaches 3, 5, 6, and 7</u>

The Total Maximum Daily Loads for Indicator Bacteria in the Santa Clara River Estuary and Reaches 3, 5, 6, and 7 became effective on March 21, 2012. Caltrans is identified as a Non-MS4 Permittee. The TMDL requires Caltrans and other non-MS4 permit, upon effective of the TMDL, to comply with the Waste Load Allocations (WLA) of zero "0" exceedance day for both Dry and Wet Weather, and for Geometric Mean in the Santa Clara River Estuary and targeted reaches. Project Engineer shall consider treatment controls for the project and consult with the District NPDES Storm Water Coordinator.

Clean Water Act (CWA) Section 401 Water Quality Certification

It is anticipated that jurisdictional wetlands will be impacted by the project, and therefore a CWA Section 401 Water Quality Certification will be required from the RWQCBs. The Section 401 Certification will be prepared and submitted during the PS&E phase.

Municipal or Domestic Water Supply Reservoirs

There are no drinking water reservoirs and or recharge facilities within the project limits.

Local Agency Requirements/Concerns

Stormwater from the proposed project will discharge to Department of Water Resources (DWR)'s jurisdiction. Work within DWR's right of way at the California Aqueduct crossings will need to be conducted during winter months when the demand for water supply is relatively low. The proposed drainage and stormwater treatment design will be reviewed by DWR during the design phase of the project.

Additional seasonal construction exclusion dates or restrictions by other agencies may be identified as other environmental studies are being completed during the PA/ED phase.

Climate

The climate of the project region is arid. The average annual high temperature is about 76°F. The hottest months are June through September when high temperatures average about 95°F and low

temperatures average about 58°F. The maximum high temperature is 114°F recorded in August 1939.

Coolest temperatures occur in the winter months of December and January when the average high is about 56°F and average low is 30°F. The minimum temperature 2°F recorded in December 1984. Extreme low temperatures occur from November to March when freezing is possible. Snowfall is possible from December through March with an annual average up to about 7 inches of snow during these months. The maximum recorded snowfall of 27 inches was recorded in 1916.

Annual precipitation is about 7.4 to 8.5 inches with most of the rain falling between December and February. The driest months are June, July, and August when rainfall is generally less than 0.1 inch per month. Monsoon-type rains occasionally occur during the summer months and cause local flooding.

Topography

The SR-138 improvements extend east-west across the Antelope Valley Watershed. The valley is generally characterized by flat, sandy terrain with widely scattered hills and isolated peaks comprised of erosion resistant bedrock formations. The valley is bounded on the south by the southeast trending San Andreas Fault zone and the Transverse Ranges. Drainage across the valley area is generally to the northeast and east. The western portion of the alignment crosses the San Andreas Fault zone and is located in the foothills of the Transverse Ranges.

Relief over the majority of the alignment is minor with a gradual elevation loss towards the east. The total elevation difference along the 36.7 miles of the proposed improvements is approximately 1,090 feet. The highest point along the alignment is about 3,410 feet above sea level at the eastern end of the Quail Lake Sky Park Airport while the lowest point is at the interchange of SR-138 and SR-14 with an elevation of approximately 2,320 feet.

Soil Characteristics

The *Preliminary Geotechnical Design Report* (Earth Mechanics, Inc. 2014) provides a detailed summary of the soils and geology within the project area. The SR-138 improvements extend east-west across the Antelope Valley between I-5 and SR-14. The

The condition and type of soil are major factors affecting infiltration and runoff. The Natural Resources Conservation Service (NRCS) has classified soils into four general categories, A, B, C, and D for comparing infiltration and runoff rates. The categories are based on properties that influence runoff, such as water infiltration rate, texture, natural discharge and moisture condition. The runoff potential is based on the water runoff at the end of a long-duration storm that occurs after wetting and swelling of soil not protected by vegetation.

Soil types on the western third of the project consist mainly of Oak Glen, Gorman, and Chino series soil per NRCS. These soils range from hydrologic B to group C. The middle third of the project consists mainly of Greenfield, Hanford, and Oak Glen series soil, with the majority of the soils falling into hydrologic soil group B. The eastern third of the project consists mainly of Greenfield, Hesperia, Pond-Oban Complex, Romona, Rosamond series soils. Hydrologic soil groups in this portion of the project range from group A to group C.

Groundwater Information

SR-138 is in the Antelope Valley Groundwater Basin, specifically West Antelope, Neenach, and Lancaster sub-basins. *Preliminary Geotechnical Report* (Earth Mechanics, Inc. 2014) prepared for the project suggests that groundwater is generally on the order of about 140 feet below ground level along the alignment. At the western end of the alignment groundwater may be locally shallower in the vicinity of the San Andreas Fault Zone. This is further supported by Lahontan RWQCB in a memorandum dated December 3, 2013 stating that "shallow groundwater occurring along the fault zone is known to support numerous perennial springs and associated wetlands."

Hazardous Waste Material

An *Initial Site Assessment (ISA) Report* is currently being prepared by Caltrans District 7 so it is unclear if any hazardous waste material is present within the project limits.

Aerially Deposited Lead (ADL)

An *Initial Site Assessment (ISA) Report* is currently being prepared by Caltrans. This report will determine the presence of ADL in the project site. Depending on the findings in the report, the soil may be reused or disposed without any restrictions, or may be classified hazardous for ADL which will require special handling and mitigation measures.

Slope Stability

The terrain in the project site is relatively flat, therefore there is little potential for slope instabilities such as landslides or rock falls. Existing cut slopes along the alignment is generally in good condition with little erosion and no major slope failures observed.

Erosion Potential

The average soil erodibility factor, k, for the soils within the project limits ranges from 0.15 to 0.25, with a weighted average of 0.20. The soil is generally more susceptible to erosion towards the western end of SR-138 and less susceptible towards the eastern end.

Risk Assessment

This project is subject to the "NPDES General Permit for Storm Water Discharges associated with Construction and Land Disturbance Activities" (NPDES Number CASO00002). In accordance with the Construction General Permit (CGP), this project is required to perform a risk assessment to determine the project risk level. The project risk level is determined from the sediment risk and the receiving water risk.

The sediment risk factor is determined from the product of rainfall runoff erosivity factor (R), the soil-erodibilty (K) factor and the Length-Slope (LS) factor. The R factor was determined from U.S. EPA's "Rainfall Erosivity Waiver Fact Sheet" to be 79.24 assuming a construction span of April 1, 2022 through November 1, 2025. The K factor was determined to be 0.2 and the LS factor was determined to be 1.18, assuming the same reference point which R factor was based on. As shown on Figure 2, Sediment Risk Factor Worksheet, the project is classified to be in the medium range sediment risk level.

The receiving water risk is classified as low because none of the project disturbed area discharges directly to a 303(d)-listed waterbody impaired by sediment. See **Figure 3**, Receiving Water Risk Factor Worksheet for details.

The combined medium sediment risk level and low receiving water risk results in the project being classified as Risk Level 2. All risk levels are subject to temporary construction site BMP implementation and visual monitoring requirements. Risk Level 2 projects require stormwater sampling at all discharge locations, with the samples subject to Numeric Action Levels for pH and turbidity. The BMP implementation and sampling required under each risk level are measures that will minimize impacts to receiving water bodies. The requirements for Risk Level 2 projects are presented in Attachment D of the Construction General Permit (CGP).

The risk levels presented in this section are based on planning level information available at the time of the preparation of this report. The actual project risk level will be refined during the PS&E phase.

Measures for Avoiding or Reducing Potential Stormwater Impacts

All work in waterways will be scheduled per regulatory requirements and will be detailed in the project's special provisions during the PS&E phase. Maintenance pullouts will be considered for the project, and side slopes will be specified as flat as possible to minimize erosion and for ease of maintenance. Concentrated flows will be collected into stabilized earth ditches or lined ditches.

Land Use

Existing land uses in the project area include agriculture, residential, commercial, municipal, and undeveloped land. The project alignment traverses predominantly undeveloped land. Several irrigated areas are located along the project alignment. Scattered single family residences and small communities of Neenach and Antelope Acres are located throughout the area. A large solar facility is located on both sides of the alignment between 175th Street West and 160th Street West. Electrical transmission lines are located adjacent to the existing roadway and cross the roadway at several locations.

Right-of-Way (R/W) Requirements

The project would involve full and/or partial R/W acquisitions from private owners and Los Angeles County for the proposed permanent facility and temporary areas for construction purposes. The R/W cost in the project area is expected to cost \$20,000/acre in general if required to construct BMPs, lay back slopes, etc. More accurate R/W costs are being developed and will be reported in the project's R/W data sheet for each alternative. A R/W certification is expected to be required for this project.

3. Regional Water Quality Control Board Agreements

A letter by Jan M. Zimmerman at the Lahontan RWQCB dated December 3, 2013 in response to the notice of preparation of the Draft Environmental Impact Report (DEIR) included general and specific comments for the project. Our project team will address these comments in various technical studies and reports in support of the DEIR, including the Storm Water Data Report. Additional details on agreements and coordination between the Lahontan and Los Angeles RWQCBs and Caltrans will be included in the next submittal.

4. Proposed Design Pollution Prevention BMPs to be used on the Project.

Downstream Effects Related to Potentially Increased Flow, Checklist DPP-1, Parts 1 and 2

The project will result in an increase in impervious surface. Additional impervious areas proposed for the project may increase the volume and velocity of the Stormwater discharge. The increase in impervious area may impact the downstream waterways without pollution prevention BMPs for the project. The net additional impervious area for the project is 414 acres, 402 acres, and 50 acres for Alternative 1, Alternative 2, and the TSM Alternative, respectively. This Project will incorporate Low Impact Design (LID) efforts to maintain or restore pre-project hydrology, as well as provide overall water quality improvement of discharges. Potential LID measures that will be considered for this Project to improve water quality include:

- Grading slopes to blend with the natural terrain and decreasing the need for dikes;
- Designing permanent drainage facilities that mimic the existing pattern of the area through the
 use of permanent check dams for attenuation of flow and disconnected drainage facilities;

- Constructing ditches with permanent check dams to decrease the velocity of discharge, plus
 decreasing the volume of discharge by promoting infiltration and allowing for pollutant removal;
 and
- Maintaining existing vegetated areas.

The effectiveness of these LID efforts, the pre and post project hydrology will be compared during the PS&E phase.

Slope/Surface Protection Systems, Checklist DPP-1, Parts 1 and 3

Areas of cut and fill are required throughout the project to satisfy the project geometry. Cut and fill areas for the project will be developed further during the PS&E phase of the project. The preliminary project geometric plans propose 4:1 (H:V) or flatter slopes in all areas of fill and 4:1 (H:V) or flatter slopes in most areas of cut, and slopes between 4:1 (H:V) and 2:1 (H:V) in several locations where the additional earthwork are cost-prohibitive. The Preliminary Geotechnical Design Report included the following list of potential mitigations that can be used to minimize surficial instability and erosion for cut slopes with a gradient of 2H:1V:

- Cover the upper 4 feet of slope face with materials with a minimum internal friction angle of 30 degrees and a minimum cohesion of 180 psf. This Select Material should be properly keyed and benched into the sloping ground, and this would require over-cutting the slope and rebuilding the slope with the above Select Material.
- Cover the slope face with special man-made erosion control mats or geo-fabric.
- Plant the slope face with low-maintenance ground cover that is adaptable to the desert-like arid conditions. A landscape architect specializing in arid environment should be consulted to select the proper ground cover.
- Use slope benching to flatten the overall gradient of the cut slope; the bench will also reduce
 the velocity of water flowing past the slope face. However, benching alone will not eliminate
 erosion of the slope face; treatment of the slope face using Select Material, slope planting or
 special matting is still required.

The project includes slopes steeper than 4:1 (H:V) and therefore an erosion control plan will be developed during the PS&E phase and submitted to the District Landscape Architect for approval. Areas with slopes between 4:1 (H:V) and 2:1 (H:V) will be coordinated with the Geotechnical Design Unit during the PS&E phase.

Retaining walls are proposed at multiple locations throughout the project where slopes cannot be graded at 2:1 (H:V) or flatter.

The minimum erosion control measures considered for this project includes:

- Move-in/Move-out (Erosion Control)
- Fiber rolls
- Rolled Erosion Control Product (Netting)

The move-in/move-out (erosion control) will be required due to the size and the three-year duration of the project construction and will be utilized to ensure permanent erosion control stabilization is in place. The fiber rolls will be placed on disturbed soils to remain unpaved or unlined. The rolled erosion control product (netting) will be placed in all drainage ditches and slopes greater than 4(H):1(V). Hard surfaces are anticipated for culvert outlet protection and energy dissipation, which would consist of concrete lined ditches, splash walls, and rock slope protection.

Concentrated Flow Conveyance Systems, Checklist DPP-1, Parts 1 and 4

Concentrated flow conveyance systems, such as ditches, flared end sections, and outlet protection/energy dissipation devices are considered in this project. Majority of the concentrated flow in the project is conveyed through ditches. Outlet protection/energy dissipation BMPs will be placed at all outlets of drainage systems. The location and design of these facilities will take place during the PS&E phase of the project.

Preservation of Existing Vegetation, Checklist DPP-1, Parts 1 and 5

It is the goal of the project to maximize the protection of desirable existing vegetation for erosion and sediment control. Existing vegetation in the project area primarily consist of species amiable to arid desert environment. Between approximately 220th Street West and 170th Street West, large groves of Joshua Trees are located on both sides of the existing SR-138. Existing vegetation to remain in place will be protected temporary Environmentally Sensitive Area (ESA) fencing during construction.

Natural Environmental Study and Wetland Study/Jurisdictional Delineation are both underway and findings from both reports will include types and limits of wetlands within the project area. Existing wetlands that can be preserved will be preserved with temporary ESA fencing during construction. Existing wetlands that cannot be preserved will be mitigated with appropriate measures identified in the environmental document and incorporated during the PS&E Phase of the project.

Total cost of Design Pollution Prevention BMPs is estimated to be \$5.1 million.

5. Proposed Permanent Treatment BMPs to be used on the Project

Treatment BMP Strategy, Checklist T-1

As this project is a major construction project that involves more than one acre of AIA for all three build alternatives, treatment BMPs would need to be considered for areas within Caltrans' R/W. As suggested by the SWDR prepared at the PID phase, infiltration devices are considered the preferred treatment BMP for its ability to treat Pollutants of Concern from typical highway runoff and recharge groundwater.

There are no Targeted Design Constituents (TDCs) within the project limits.

Corridor Stormwater Management Studies (Corridor Studies) are available for SR-138 from PM 0.0 to PM 2.4 and for I-5 from PM 43.9 to PM 46.4 and PM 59.0 to PM 87.4. The BMPs identified in the two

Corridor Studies that were incorporated into the project are listed in **Table 3** and **Table 4**. The BMPs that are outside of existing or proposed right-of-way, not compatible with the proposed project condition, or outside of project impact limits were determined not to be feasible for inclusion in this project.

Table 3 Corridor Study BMPs Incorporated in Alternatives 1 & 2

Corridor Study BMP Site	Treatment BMP ID	Post Mile	BMP Type
Site 91A	1 S	80.78	Biofiltration Swale
Site 93	2S	80.85	Infiltration Trench
Site 91B	3S	81.02	Biofiltration Swale
Site 91C	4 S	81.28	Biofiltration Swale
Site 103B	6S	81.93	Biofiltration Swale
Site 106A	7S	82.37	Biofiltration Swale
Site 107A	8S	82.55	Biofiltration Swale
Site 17	9S	0.76	Biofiltration Swale
Site 19	9-1S	0.87	Biofiltration Swale
Site 20	9-2S	0.88	Biofiltration Swale
Site 24	108	1.43	Biofiltration Strip
Site 25	11S	1.25	Biofiltration Swale
Site 27 & 28	138	1.70	Biofiltration Swale & Strip
Site 29	148	1.84	Biofiltration Swale

Table 4 Corridor Study BMPs Incorporated in the TSM Alternative

Corridor Study BMP Site	Treatment BMP ID	Post Mile	BMP Type
Site 31	1A	2.13	Biofiltration Swale
Site 32	1B	2.20	Biofiltration Swale

No Gross Solid Removal Devices (GSRDs) are proposed for this project because none of the project receiving water bodies is listed on the 303(d) list as impaired by trash or litter pollution.

At the PA/ED phase, detailed design and site information is not available and therefore potential treatment BMP locations are identified based on preliminary information. The potential treatment BMP locations, preliminary sizes, and approximate impervious areas treated are listed in **Table 4 and 5** for Alternative 1 and the TSM Alternative, respectively.

For areas outside of Caltrans' R/W, treatment BMP strategy will follow the 2014 Los Angeles County Public Works Low Impact Development Standards Manual. Since the project involves more than one

acre of disturbed area and proposes to add more than 10,000 square feet of impervious surface area, it is required to meet stormwater management requirements for "Designated Projects," which "must retain 100 percent of the Stormwater Quality Design Volume on-site through infiltration, evapotranspiration, stormwater runoff harvest and use, or a combination thereof unless it is demonstrated that it is technically infeasible to do so."

Biofiltration Swales/Strips, Checklist T-1, Parts 1 and 2

Biofiltration Swales/Strips are likely not feasible for the majority of the corridor, with the exception of the western end near I-5, because the arid climate may not allow establishment or support the livelihood of vegetative cover needed for filtration through soil. New water supplies would need to be developed in the form of new wells to establish and maintain vegetation; however, new wells are impractical due to low groundwater level, high cost and the current drought condition in California.

Dry Weather Diversion, Checklist T-1, Parts 1 and 3

Dry weather flows are not anticipated within the project limits. Therefore, these devices are not feasible and are not proposed to be incorporated in the project.

Infiltration Devices - Checklist T-1, Parts 1 and 4

Infiltration devices in the form of linear infiltration trenches are considered generally feasible for the project for the following reasons:

- The majority of project area is classified into Hydrologic Soil Groups (HSGs) A or B, estimated to have an infiltration rate greater than 0.5 inches per hour, based on published data from the Natural Resources Conservation Service (NRCS) Web Soil Survey. In-situ permeability tests will be conducted during the PS&E phase for each potential BMP site, including biofiltration swales and strips and infiltration trenches, to obtain a site-specific infiltration rate for BMP design and sizing.
- The groundwater table is generally on the order of about 140 feet below ground level along the alignment, thus allowing significant filtration through soil before runoff reaches the groundwater.
- The extremely flat terrain on the eastern portion of the corridor (on average 0.5% grade), between approximately 1,000 feet east of 140th Street and SR-14, facilitate maximum filtration.
- Recharging of the groundwater basin will help alleviate the drought condition.

Infiltration trenches will generally include a trench filler material with sufficient porosity wrapped within a filter fabric, a surface gravel layer, an observation well for monitoring and maintenance purposes. The dimensions (length, width and depth) of each infiltration trench will vary depending on site constraints and will be determined during the PS&E phase. The preliminary location and limit of proposed infiltration trenches are shown on maps included in Supplemental Attachments.

Since Alternatives 1 and 2 are similar in treatment requirement (i.e. total net AIAs) and includes mostly identical BMP locations, separate maps for Alternative 2 are not attached to this report, with the exception of three select locations (Cement Road Intersection, 300th Street West Intersection and SR-138/SR-14 Interchange) where the proposed roadway improvements are significantly different between the two alternatives.

Tables 5 and 6 provide the approximate area and treated impervious area for each potential treatment BMP under Alternative 1 and the TSM Alternative, respectively. Under Alternative 1, there are 137 proposed infiltration trenches with a total treated WQV of 15.8 acre-feet. Areas for proposed BMPs in Alternative 2 are not provided because they are identical to those proposed in Alternative 1 with a few exceptions. BMPs proposed in Alternative 2 will be designed to treat the same WQV as in Alternative 1. Under the TSM Alternative, there are 8 proposed infiltration trenches with a total treated WQV of 0.4 acre-feet. Table 7 shows the total areas required for treatment, proposed treated areas and the % of proposed treatment areas versus required treatment areas for each build alternative. Potential BMPs identified would treat 85%, 85% and 84% of the total AlAs for Alternatives 1, 2, and the TSM Alternative, respectively. In addition, proposed BMPs in Alternatives 1 and 2 will treat approximately 180 acres of unpaved areas, and Alternative 3 will treat approximately 20 acres of unpaved areas.

Proposed Treatment BMPs for Alternative 1 Table 5

Treatment BMP No.	Treatment BMP ID	BMP Type	Approximate Station	Offset	BMP Area (ac)	Treated Impervious Area (ac)
1	25-1	Infiltration Trench	1081+00	RT	0.04	1.7
2	25-2	Infiltration Trench	1082+00	RT	0.06	2.0
3	26	Infiltration Trench	1094+00	LT	0.09	3.1
4	29-1	Infiltration Trench	1100+00	LT	0.05	1.9
5	29-2	Infiltration Trench	1115+00	LT	0.05	2.0
6	31	Infiltration Trench	1115+00	RT	0.06	2.2
7	35	Infiltration Trench	1144+00	LT	0.04	1.6
8	37	Infiltration Trench	1143+00	LT	0.04	1.6
9	38	Infiltration Trench	1160+00	LT	0.05	1.7
10	39	Infiltration Trench	1147+00	LT	0.04	1.6
11	40	Infiltration Trench	1161+00	RT	0.05	2.1
12	41	Infiltration Trench	1148+00	RT	0.04	1.5
13	43	Infiltration Trench	1170+00	LT	0.04	1.6
14	44-1	Infiltration Trench	1179+00	RT	0.06	2.5
15	48	Infiltration Trench	1189+00	RT	0.04	1.6
16	49	Infiltration Trench	1206+00	RT	0.05	2.2
17	50	Infiltration Trench	1198+00	LT	0.04	1.3
18	52	Infiltration Trench	1206+00	LT	0.04	1.2
19	54A	Infiltration Trench	1218+00	LT	0.04	1.4
20	55	Infiltration Trench	1214+00	RT	0.04	1.4
21	63-1	Infiltration Trench	1247+00	LT	0.04	1.5
22	63-2	Infiltration Trench	1275+00	LT	0.04	1.2
23	63-3	Infiltration Trench	1289+00	LT	0.06	2.1
24	65	Infiltration Trench	1246+00	RT	0.04	1.4
25	68	Infiltration Trench	1274+00	RT	0.04	1.5
26	71	Infiltration Trench	1290+00	RT	0.06	2.4
27	72	Infiltration Trench	1304+00	LT	0.05	1.8
28	73	Infiltration Trench	1303+00	RT	0.05	2.0
29	74	Infiltration Trench	1326+00	RT	0.07	3.0
30	75	Infiltration Trench	1313+00	LT	0.04	1.7
31	76	Infiltration Trench	1322+00	LT	0.04	1.7

Treatment BMP No.	Treatment BMP ID	BMP Type	Approximate Station	Offset	BMP Area (ac)	Treated Impervious Area (ac)
32	81	Infiltration Trench	1340+00	RT	0.04	1.8
33	86	Infiltration Trench	1344+00	RT	0.04	1.6
34	90	Infiltration Trench	1384+00	LT	0.05	2.2
35	91	Infiltration Trench	1384+00	RT	0.09	3.1
36	93-1	Infiltration Trench	1392+00	LT	0.04	1.2
37	93-2	Infiltration Trench	1402+00	LT	0.08	2.7
38	98A	Infiltration Trench	1404+00	RT	0.05	1.7
39	100	Infiltration Trench	1441+00	LT	0.04	1.5
40	101	Infiltration Trench	1441+00	RT	0.04	1.4
41	103	Infiltration Trench	1453+00	LT	0.05	1.8
42	105-1	Infiltration Trench	1453+00	RT	0.05	1.6
43	105-2	Infiltration Trench	1469+00	RT	0.03	1.1
44	107	Infiltration Trench	1469+00	LT	0.04	1.6
45	110	Infiltration Trench	1487+00	LT	0.04	1.4
46	112	Infiltration Trench	1497+00	LT	0.06	2.6
47	116-1	Infiltration Trench	1521+00	LT	0.07	2.6
48	116-2	Infiltration Trench	1536+00	LT	0.05	1.7
49	118	Infiltration Trench	1520+00	RT	0.03	1.4
50	119	Infiltration Trench	1539+00	RT	0.04	1.6
51	121-1	Infiltration Trench	1560+00	RT	0.04	1.4
52	121-2	Infiltration Trench	1587+00	RT	0.08	2.8
53	123	Infiltration Trench	1560+00	LT	0.04	1.3
54	125-1	Infiltration Trench	1589+00	LT	0.07	3.0
55	125-2	Infiltration Trench	1605+00	LT	0.08	3.2
56	129-1	Infiltration Trench	1624+00	RT	0.09	3.6
57	129-2	Infiltration Trench	1625+00	RT	0.08	3.0
58	132	Infiltration Trench	1624+00	LT	0.05	2.0
59	136	Infiltration Trench	1644+00	LT	0.05	1.9
60	137	Infiltration Trench	1644+00	RT	0.04	1.5
61	140-1	Infiltration Trench	1675+00	LT	0.08	3.3
62	140-2	Infiltration Trench	1710+00	LT	0.09	3.5
63	141	Infiltration Trench	1674+00	RT	0.07	3.1

Treatment BMP No.	Treatment BMP ID	BMP Type	Approximate Station	Offset	BMP Area (ac)	Treated Impervious Area (ac)
64	143-1	Infiltration Trench	1708+00	RT	0.09	3.7
65	143-2	Infiltration Trench	1731+00	RT	0.08	3.0
66	146	Infiltration Trench	1731+00	LT	0.05	2.2
67	149-1	Infiltration Trench	1763+00	LT	0.09	3.5
68	149-2	Infiltration Trench	1765+00	LT	0.05	1.6
69	151-1	Infiltration Trench	1764+00	RT	0.07	2.7
70	151-2	Infiltration Trench	1764+00	RT	0.04	1.6
71	156	Infiltration Trench	1779+00	LT	0.05	1.8
72	158-1	Infiltration Trench	1778+00	RT	0.04	1.7
73	158-2	Infiltration Trench	1793+00	RT	0.04	1.4
74	167	Infiltration Trench	1838+00	LT	0.04	1.6
75	168	Infiltration Trench	1855+00	RT	0.04	1.5
76	171	Infiltration Trench	1855+00	LT	0.05	1.8
77	180	Infiltration Trench	1893+00	LT	0.06	2.2
78	181-1	Infiltration Trench	1893+00	RT	0.06	2.3
79	181-2	Infiltration Trench	1919+00	RT	0.06	2.2
80	188	Infiltration Trench	1919+00	LT	0.05	1.8
81	190	Infiltration Trench	1932+00	LT	0.05	1.7
82	194	Infiltration Trench	1959+00	LT	0.08	3.1
83	195	Infiltration Trench	1959+00	RT	0.09	3.7
84	198	Infiltration Trench	1986+00	LT	0.08	3.2
85	199	Infiltration Trench	1985+00	RT	0.08	3.3
86	202	Infiltration Trench	1995+00	LT	0.04	1.3
87	204	Infiltration Trench	1995+00	RT	0.04	1.5
88	205	Infiltration Trench	2013+00	LT	0.06	2.3
89	207	Infiltration Trench	2013+00	RT	0.07	2.5
90	208	Infiltration Trench	2037+00	LT	0.08	3.3
91	210	Infiltration Trench	2037+00	RT	0.08	3.2
92	212	Infiltration Trench	2051+00	LT	0.04	1.6
93	213	Infiltration Trench	2057+00	RT	0.06	2.3
94	220	Infiltration Trench	2104+00	LT	0.08	3.5
95	222	Infiltration Trench	2104+00	RT	0.08	3.3

Treatment BMP No.	Treatment BMP ID	BMP Type	Approximate Station	Offset	BMP Area (ac)	Treated Impervious Area (ac)
96	223	Infiltration Trench	2117+00	LT	0.04	1.5
97	225	Infiltration Trench	2117+00	RT	0.04	1.5
98	226	Infiltration Trench	2144+00	LT	0.07	2.8
99	228	Infiltration Trench	2144+00	RT	0.07	2.9
100	229	Infiltration Trench	2170+00	LT	0.08	2.9
101	231	Infiltration Trench	2170+00	RT	0.08	2.9
102	235	Infiltration Trench	2196+00	LT	0.05	2.0
103	237	Infiltration Trench	2196+00	RT	0.05	2.0
104	238	Infiltration Trench	2207+00	LT	0.04	1.5
105	240	Infiltration Trench	2207+00	RT	0.04	1.4
106	241	Infiltration Trench	2250+00	LT	0.09	3.7
107	243	Infiltration Trench	2250+00	RT	0.09	3.8
108	248	Infiltration Trench	2304+00	LT	0.10	4.2
109	249	Infiltration Trench	2304+00	RT	0.11	4.4
110	250	Infiltration Trench	2355+00	LT	0.10	4.2
111	251	Infiltration Trench	2355+00	RT	0.10	4.3
112	252-1	Infiltration Trench	2387+00	LT	0.08	3.2
113	252-2	Infiltration Trench	2423+00	LT	0.09	3.6
114	252-3	Infiltration Trench	2462+00	LT	0.10	4.0
115	253-1	Infiltration Trench	2391+00	RT	0.10	3.7
116	253-2	Infiltration Trench	2425+00	RT	0.10	3.8
117	253-3	Infiltration Trench	2462+00	RT	0.11	4.3
118	255	Infiltration Trench	2515+00	LT	0.12	4.9
119	256	Infiltration Trench	2515+00	RT	0.12	4.9
120	258	Infiltration Trench	2568+00	LT	0.12	4.8
121	259	Infiltration Trench	2568+00	RT	0.12	5.0
122	260	Infiltration Trench	2620+00	LT	0.12	4.8
123	261	Infiltration Trench	2620+00	RT	0.11	4.7
124	263-1	Infiltration Trench	2656+00	LT	0.11	4.1
125	263-2	Infiltration Trench	2692+00	LT	0.09	3.5
126	263-3	Infiltration Trench	2727+00	LT	0.10	3.8
127	264-1	Infiltration Trench	2656+00	RT	0.11	4.4

Treatment BMP No.	Treatment BMP ID	BMP Type	Approximate Station	Offset	BMP Area (ac)	Treated Impervious Area (ac)
128	264-2	Infiltration Trench	2692+00	RT	0.08	3.3
129	264-3	Infiltration Trench	2727+00	RT	0.09	3.3
130	267	Infiltration Trench	2779+00	LT	0.12	4.9
131	268	Infiltration Trench	2779+00	RT	0.12	4.8
132	270	Infiltration Trench	2815+00	LT	0.10	3.9
133	271	Infiltration Trench	2815+00	RT	0.10	4.0
134	18	Biofiltration Swale	4255+00	LT	0.05	0.7
135	2\$	Infiltration Device	4268+00	LT	0.04	1.3
136	3S	Biofiltration Swale	4280+00	Median	0.05	0.8
137	48	Biofiltration Swale	4290+00	Median	0.05	1.2
138	6S	Biofiltration Swale	4320+00	Median	0.05	2.2
139	7S	Biofiltration Swale	4247+00	Median	0.05	1.3
140	88	Biofiltration Swale	4355+00	Median	0.05	0.9
141	98	Biofiltration Swale	940+00	LT	0.05	1.2
142	9-1S	Biofiltration Swale	945+00	Median	0.05	0.3
143	9-2S	Biofiltration Swale	945+00	RT	0.05	0.8
144	108	Biofiltration Strip	965+00	Median	0.05	1.6
145	11S	Biofiltration Swale	965+00	RT	0.05	1.3
146	138	Biofiltration Strip & Swale	988+00	Median	0.05	1.0
147	14S	Biofiltration Swale	996+00	Median	0.05	0.9

Table 6 Proposed Treatment BMPs for TSM Alternative

Treatment BMP No.	Treatment BMP ID	BMP Type	Approximate Station	Offset	BMP Area (ac)	Treated Impervious Area (ac)
1	1	Infiltration Trench	103+00	LT	0.02	0.8
2	2	Infiltration Trench	183+00	LT	0.04	1.6
3	3	Infiltration Trench	191+00	RT	0.05	1.9
4	5	Infiltration Trench	225+00	LT	0.05	1.7
5	9	Infiltration Trench	265+00	RT	0.03	1.1
6	10	Infiltration Trench	290+00	LT	0.06	2.0
7	11	Infiltration Trench	290+00	RT	0.04	1.4
8	12	Infiltration Trench	312+00	LT	0.05	1.2
9	13	Infiltration Trench	312+00	RT	0.03	1.1
10	14	Infiltration Trench	328+00	LT	0.03	1.0
11	15	Infiltration Trench	330+00	RT	0.03	1.0
12	18	Infiltration Trench	365+00	RT	0.03	1.1
13	19	Infiltration Trench	365+00	LT	0.03	1.0
14	20	Infiltration Trench	385+00	LT	0.03	1.1
15	21	Infiltration Trench	385+00	RT	0.02	1.0
16	24	Infiltration Trench	427+00	LT	0.03	1.2
17	25	Infiltration Trench	429+00	RT	0.03	1.3
18	26	Infiltration Trench	455+00	LT	0.03	1.2
19	27	Infiltration Trench	455+00	RT	0.03	1.2
20	29	Infiltration Trench	475+00	RT	0.04	1.2
21	30	Infiltration Trench	510+00	LT	0.05	1.8
22	31	Infiltration Trench	510+00	RT	0.05	1.6
23	32	Infiltration Trench	514+00	LT	0.05	1.9
24	33	Infiltration Trench	515+00	RT	0.06	2.1
25	34	Infiltration Trench	585+00	LT	0.07	2.3
26	35	Infiltration Trench	585+00	RT	0.05	1.8
27	38	Infiltration Trench	680+00	LT	0.04	1.4
28	39	Infiltration Trench	680+00	RT	0.04	1.5
29	42	Infiltration Trench	723+00	RT	0.07	2.6
30	1A	Biofiltration Swale	120+00	RT	0.05	0.2
31	1B	Biofiltration Swale	123+00	RT	0.05	0.3

Table 7 Treatment Goals

		Area (ac)				
		Alternative 1				
	Alternative	Bypass	Alternative	TSM		
Description	1	Option	2	Alternative		
Total Impervious Area Treatment	414	425	402	50		
Required						
Total Impervious Area Treated by	350	350	340	42		
BMPs						
% Treated by BMPs	85	82	85	84		

Detention Devices, Checklist T-1, Parts 1 and 5

Detention devices are feasible but are not incorporated for this project. Typically detention devices are considered only when infiltration devices are not feasible.

Gross Solids Removal Devices (GSRDs), Checklist T-1, Parts 1 and 6

There are no TMDLs for trash within the project limits. Therefore, GSRDs are not required and are not proposed to be incorporated into the project.

Traction Sand Traps. Checklist T-1. Parts 1 and 7

Based on our discussion with Caltrans Maintenance staff, traction sand is applied to the corridor due to the occasional snowfall. More coordination with Caltrans Maintenance is needed during the PS&E phase to understand the frequency of the traction sand application and determine this will change as a result of the proposed improvements on SR-138.

Media Filters, Checklist T-1, Parts 1 and 8

Austin Sand Filters are feasible but are not incorporated for this project. Austin Sand Filters are typically used as an alternative to infiltration trenches when the groundwater is high. Since infiltration trenches are feasible and groundwater is generally low in the project area, Austin Sand Filters are not proposed to be incorporated into the project.

Multi-Chambered Treatment Trains (MCTTs), Checklist T-1, Parts 1 and 9

MCTTs are not feasible because they do not serve a "critical source area" and are not proposed to be placed on this project.

Wet Basins, Checklist T-1, Parts 1 and 10

A permanent source of water is not available within the project limits; therefore wet basins are not feasible for this project.

Total estimated cost for proposed treatment BMPs is \$11.3 million.

6. Proposed Temporary Construction Site BMPs to be used on Project

As presented in Section 2 of this report, this project is classified as Risk level 2. This section presents the temporary construction site BMP strategy implemented to meet both current Caltrans criteria and the requirements presented in Construction General Permit (CGP). The requirements for Risk Level 2 are presented in Attachment D of the CGP.

The project is within the jurisdiction of Caltrans District 7. The elevation of the project site is between 2,300 feet and 3,400 feet. Based on the project location and elevation, the project is within the Rainfall Area 5, as defined in Table 2-1 of the *Caltrans Construction Site BMP Manual* (March 2003). On March 17 2015, the acting District 7 Construction Storm Water Coordinator, Jimmy Chan, reviewed the project's proposed construction site BMP strategy and concurred with the proposed strategy used for the scope of this project.

Storm Water Pollution Prevention Plan (SWPPP)

The project has a DSA of 2,347 acres, 1,889 acres and 27 acres for Alternatives 1 and 2 and TSM Alternative, respectively. A SWPPP is required for this project since the DSA is more than 1.0 acre for all build alternatives being considered, and must be prepared prior to the start of construction. The SWPPP also includes the development of a Construction Site Monitoring Program that presents procedures and methods related to the visual monitoring and sampling and analysis plans for non-visible pollutants, sediment and turbidity, pH and receiving waters.

Rain Event Action Plan

The project is anticipated to be Risk Level 2, and therefore a Rain Event Action Plan (REAP) is required in accordance with the CGP. The REAP shall be developed by a Qualified SWPPP Practitioner (QSP) at least 48 hours prior to any likely precipitation event. The quantities and costs for a REAP will be determined during the PS%E phase.

Storm Water Sampling and Analysis

The project is anticipated to be Risk Level 2, and therefore Stormwater Sampling and Analysis is required. The required specifications will be prepared during the PS&E phase and will be included in the Special Provisions of the Project Specifications.

Construction Site BMP Strategy

The Temporary Construction Site BMP strategy for this project consists of the following:

- Soil Stabilization Measures
- Sediment Control Measures
- Tracking Control
- Job Site Management
 - Non-Stormwater Management
 - Materials Handling
 - Paving Operations
 - Stockpile Management
 - Water Conservation Practices
 - Storm Drain Inlet Protection
 - Stabilized Construction Entrance/Exit
 - Waste Management
 - Spill Prevention and Control
 - Solid Waste Management
 - Hazardous Waste Management
 - Contaminated Soil Management
 - Concrete Waste Management
 - Sanitary/Septic Waste Management
 - Liquid Waste Management
- Stormwater Sampling and Analysis
- Stormwater Sampling and Analysis Day

On August 8, 2015, Jimmy Chan, Acting District Construction Storm Water Coordinator agreed to the temporary construction site BMP strategy used for the scope of this project.

The estimated cost for Construction Site BMPs is \$11.4 million.

7. Maintenance BMPs (Drain Inlet Stenciling)

Drain inlet stenciling is anticipated to be required in all drain inlets in areas accessible to pedestrian and bicycle traffic. The stenciling detail provided in the Caltrans Standard Plans will be specified for drainage inlets with-in the State R/W. Stenciling within the County R/W will be per the County standards, if required. The quantities, details, and specifications for the drain inlet stenciling will be provided in the PS&E phase of the project. Other types of maintenance BMPs, including placement maintenance vehicle pullouts, will be considered during the design phase and coordinated with the Caltrans Maintenance Area Manager.

Required Attachments

Vicinity Map

- Evaluation Documentation Form (EDF)
- Risk Level Determination Documentation

Supplemental Attachments

Note: Supplement Attachments are to be supplied during the SWDR approval process; where noted, some of these items may only be required on a project-specific basis.

- Alternatives Overview Maps
- Storm Water BMP Cost Summary
- Treatment BMP Location Concept Plans
- Checklist SW-1, Site Data Sources
- Checklist SW-2, Storm Water Quality Issues Summary
- Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water BMPs
- Checklists DPP-1, Parts 1–5 (Design Pollution Prevention BMPs) [only those parts that are applicable]
- Checklists T-1, Parts 1–10 (Treatment BMPs) [only those Parts that are applicable]
- Deviation of BMPs From the Corridor Study Recommendation



Figure 1 Vicinity Map

DATE: 8/11/2015

Project ID (or EA): __EA 265100_____

NO.	CRITERIA	YES ✓	NO ✓	SUPPLEMENTAL INFORMATION FOR EVALUATION
1.	Begin Project Evaluation regarding requirement for consideration of Treatment BMPs	√		See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs. Go to 2
2.	Is this an emergency project?		✓	If Yes , go to 10. If No , continue to 3.
3.	Have TMDLs or other Pollution Control Requirements been established for surface waters within the project limits? Information provided in the water quality assessment or equivalent document.	✓		If Yes , contact the District/Regional NPDES Coordinator to discuss the Department's obligations under the TMDL (if Applicable) or Pollution Control Requirements, go to 9 or 4. (Dist./Reg. SW Coordinator initials) If No , continue to 4.
4.	Is the project located within an area of a local MS4 Permittee?	✓		If Yes . (<i>Los Angeles County</i>), go to 5. If No , document in SWDR go to 5.
5.	Is the project directly or indirectly discharging to surface waters?	✓		If Yes , continue to 6. If No , go to 10.
6.	Is it a new facility or major reconstruction?	✓		If Yes , continue to 8. If No , go to 7.
7.	Will there be a change in line/grade or hydraulic capacity?		√	If Yes , continue to 8. If No , go to 10.
8.	Does the project result in a <u>net</u> increase of one acre or more of new impervious surface?	√		If Yes , continue to 9. If No , go to 10. Net AlAs: 414 acres (Alt 1); 402 acres (Alt 2); 50 acres (TSM Alt)
9.	Project is required to consider approved Treatment BMPs.	✓	See Sections 2.4 and either Section 5.5or 6.5 for BMP Evaluation and Selection Process. Complete Checklist T-1 in this Appendix E.	
10.	Project is not required to consider Treatment BMPs(Dist./Reg. Design SW Coord. Initials)(Project Engineer Initials)(Date)			nt for Project Files by completing this form, ching it to the SWDR.

1 See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs

Sediment Risk Factor Worksheet Entry A) R Factor Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of El30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site. http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm 79.24 R Factor Value B) K Factor (weighted average, by area, for all site soils) The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted. Site-specific K factor guidance K Factor Value 0.2 C) LS Factor (weighted average, by area, for all slopes) The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslopelength factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction. LS Table LS Factor Value 1.18 Watershed Erosion Estimate (=RxKxLS) in tons/acre 18.70064 Site Sediment Risk Factor Low Sediment Risk: < 15 tons/acre Medium Medium Sediment Risk: >=15 and <75 tons/acre High Sediment Risk: >= 75 tons/acre

Figure 2 Sediment Risk Factor Worksheet

Receiving Water (RW) Risk Factor Worksheet	Entry	Score
A. Watershed Characteristics	yes/no	
A.1. Does the disturbed area discharge (either directly or indirectly) to a 303(d)-listed waterbody impaired by sediment? For help with impaired waterbodies please check the attached worksheet or visit the link below:		
2006 Approved Sediment-impared WBs Worksheet http://www.waterboards.ca.gov/water_issues/programs/tmdl/303d_lists2006_epa.shtml	no	Low
OR	110	LOW
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY?		
http://www.ice.ucdavis.edu/geowbs/asp/wbquse.asp		

Figure 3 Receiving Water Risk Factor Worksheet

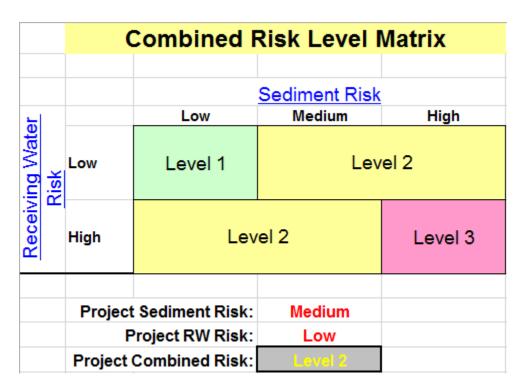


Figure 4 Combined Risk Level Matrix

Rainfall Erosivity Factor Calculator for Small Construction Sites

Facility Information

 Start Date:
 04/01/2022

 End Date:
 11/01/2025

 Latitude:
 34.7747

 Longitude:
 -118.4752

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF **79.24** HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF **04/01/2022** – **11/01/2025**.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. You do NOT qualify for a waiver from NPDES permitting requirements.

Figure 5 R Factor

(Data source: http://water.epa.gov/polwaste/npdes/stormwater/Rainfall-Erosivity-Factor-Calculator.cfm; Date Accessed: 8/1/2015)

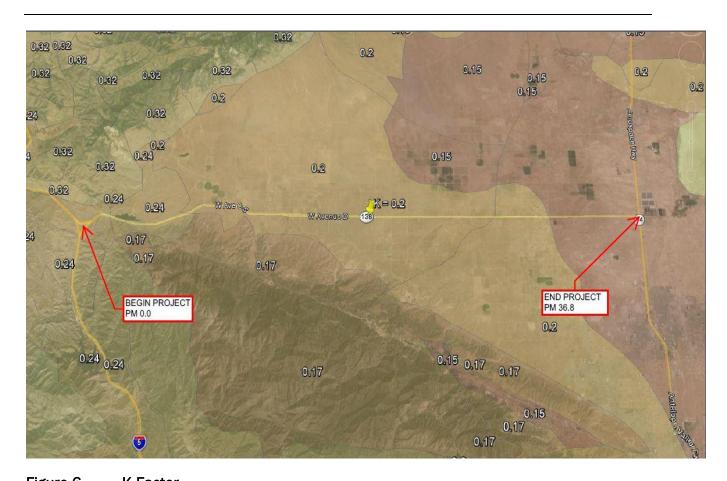


Figure 6 K Factor

(Data source for K Factor: State Water Quality Control Board; Map source: Google Earth)

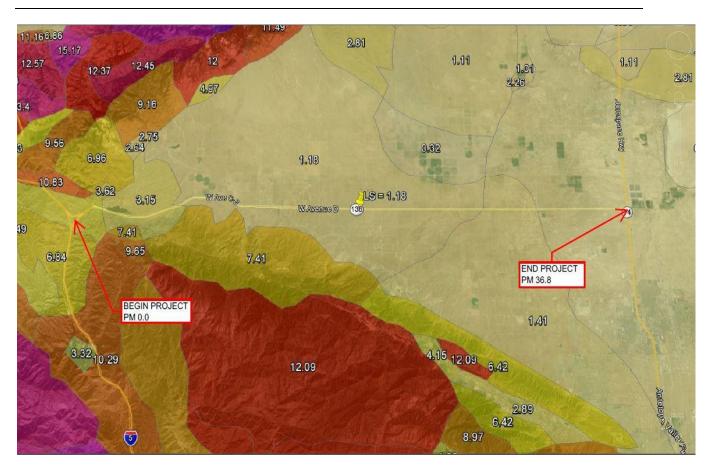


Figure 7 LS Factor

(Data source for LS Factor: State Water Quality Control Board; Map source: Google Earth)

Northwest 138 Corridor Improvement Project

Supplemental Attachments

Alternatives Overview Maps

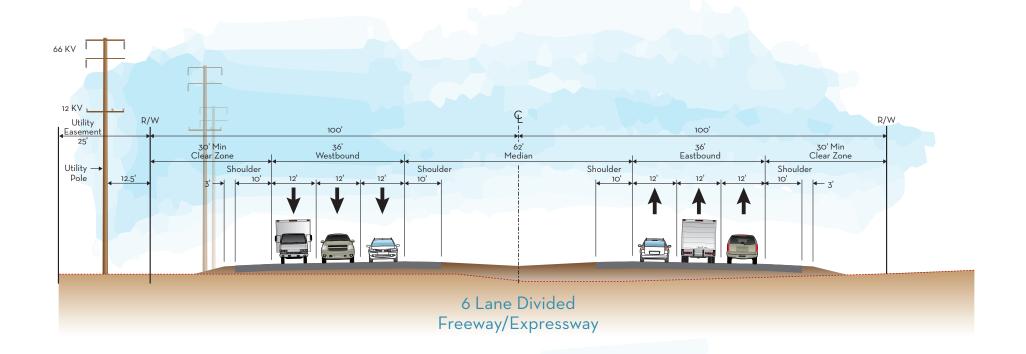
Storm Water BMP Cost Summary

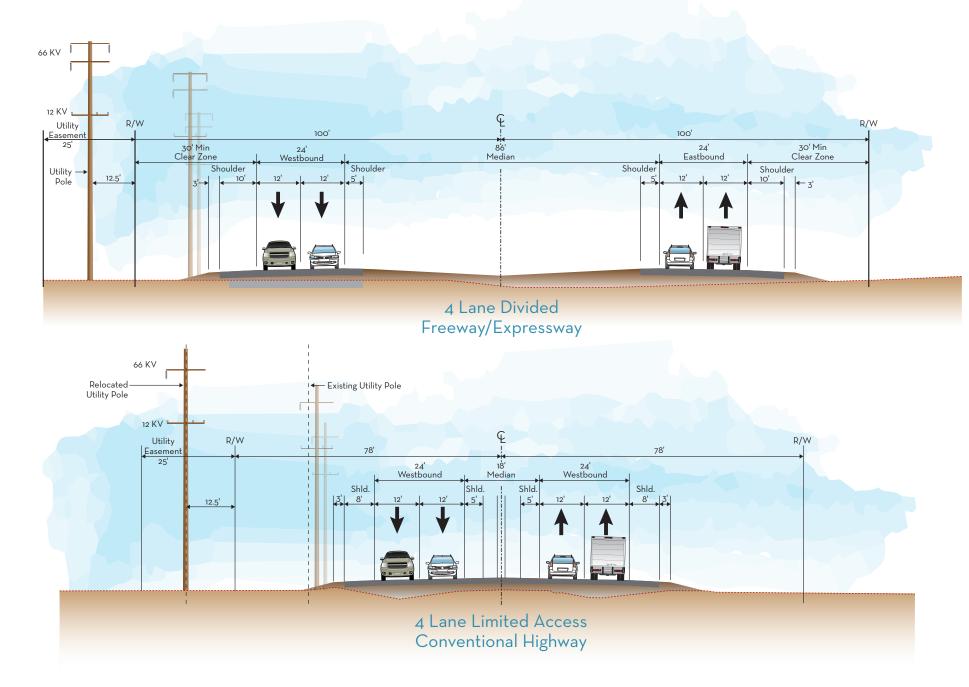
Treatment BMP Location Concept Plans

Checklists SW-1, SW-2, SW-3, DPP-1 and T-1

Deviation of BMPs from Corridor Study Recommendation

Northwest 138 Corridor Improvement Project





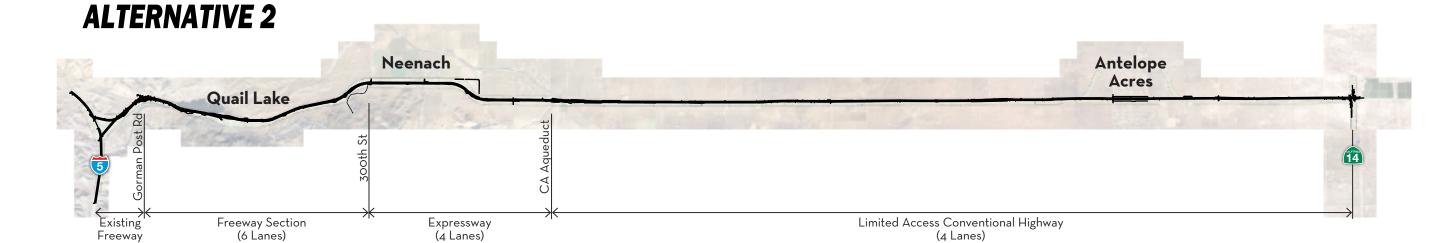






Northwest 138 Corridor Improvement Project











(6 Lanes)

Project Name:	Northwest 138 Corridor Impro	vement Project
District:	7	
EA:	265100	
County:	LA	
Route:	138	
Begin PM:	0	
End PM:	36.8	

Total Treatment BMP Costs \$	11,310,480
Total Design Pollution Prevention BMP Costs \$	5,145,000
Total Permanent Storm Water BMP Costs \$	16,455,480
Subtotal Soil Stabilization BMPs \$	1,756,000
Subtotal Sediment Control BMPs \$	4,715,000
Subtotal Wind Erosion Control BMPs \$	2,700,000
Subtotal Tracking Control BMPs \$	60,000
Subtotal Waste Management & Materials Handling BMPs \$	360,000
Subtotal Non-Storm Water Management \$	1,000,000
Subtotal Miscellaneous Items \$	847,250
Total Construction Site BMP Costs \$	11,438,250
	<u></u> _

Treatment BMPs

BMP ID	Pollution Prevention BMPs PPDG Appendix A	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost (\$/Unit)	Cos	t (\$)
	Infiltration Trench			135	EA	\$83,000	\$	11,205,000
	Biofiltration Swale			3266	SQYD	\$30	\$	97,980
	Biofiltration Strip			1500	SQYD	\$5	\$	7,500
							\$	-
			Total Tr	eatment BM	P Costs	_	\$	11,310,480

Design Pollution Prevention BMPs

BEES	Pollution Prevention BMPs PPDG Appendix A	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost (\$/Unit)	Cos	t (\$)	
	Downstream Effects/Increased Flow Mitigation				LS		\$	_	
	Slope/Surface Protection Systems-				LO		Ψ	-	
	Hard Surfaces								
	- Slope Paving				ft ²		\$	-	
721008	Energy Disspation Device			153	EA	\$15,000	\$	2,295,000	
	Slope/Surface Protection Systems- Vegetated Surfaces								
200001	Highway Planting			1	LS	\$2,800,000	\$	2,800,000	
208000	Irigation System				LS		\$	-	
	- Erosion Control [Erosion Control (Type D), Erosion Control Blanket, etc.]				ft ²		\$	-	
	Concentrated Flow Conveyance Systems								
206401	Maintain Existing Irrigation Facilities				LS				
204096	- Preservation of Existing Vegetation			1	LS	\$50,000	\$	50,000	
	Total Design Pollution Prevention BMP Costs \$								

Total Permanent Storm Water BMP Costs	\$ 16,455,480

Temporary Construction Site BMPs

			/						
		Temporary BMPs - PPDG	SSP/nSSP	STD. Det.			Unit Cost		Cost
ID	BEES	Appendix C	(#, Y or N)	(Y or N)	Quantity	Unit	(\$/Unit)		(\$)
		Temporary Soil Stabilization							
00.4		Move-In/Move-out (Temporary							=
SS-1	074037	Erosion Control)	07-485	No	70	EA	800	\$	56,000
SS-1		Scheduling		No	1	LS	50,000	\$	50,000
SS-2		Preservation of Exist Vegetation		No	1	LS	50,000	\$	50,000
SS-2	141000	Temporary Fence (Type ESA)	07-446	Yes	50000	ft	7	\$	350,000
SS-2		Environmentally Sensitive Area	S5-760	No		LS		\$	-
SS-2		Preservation of Property	07-450	No		LS		\$	-
SS-3	074039	Hydraulic Mulch	07-350	No		ft ²		\$	-
		Temp. Hydraulic Mulch (Bonded							
SS-3	074039	Fiber Matrix)	07-381	No		ft ²		\$	-
		Temp. Hydraulic Mulch (Polymer				. 2			
SS-3	074040	Stabilized Fiber Matrix)	07-382	No		ft ²		\$	-
00.4	07.4000	Temporary Erosion Control	.= .=.			e.2			=
SS-4	074023	(Hydroseeding)	07-350	No	2000000	ft ²	0.25	\$	500,000
SS-5	074025	Soil Binders		No		ft ²		\$	-
SS-5	074040	Bonded Fiber Matrix	07-XYZ	No		ft ²		\$	-
SS-6		Straw Mulch	07-350	No		ft ²		\$	-
SS-7	074027	Erosion Control Blankets/Mats	07-390	Yes	2000000	ft ²	0.25	\$	500,000
SS-8		Wood Mulching		No		ft ²		\$	-
SS-8	074026	Temporary Mulch	07-380	No		ft ²		\$	-
		Earthwork w/edits for Trackwalking	19-010	No		ft ²		\$	-
		Temporary Concentrated Flow							
		Conveyance Controls							
		Earth Dikes/Drainage Swales &							
SS-9		Lined Ditches		No		ft		\$	-
00.40		Outlet Protection/Velocity Dissipation							.=
SS-10		Devices	70.4.000		50	EA	5,000	\$	250,000
SS-10		Flared Culvert End Sections	70-1.02C	NI-		EA		ψ	
SS-11		Slope Drains	69-010,	No		ft		\$	-
			020, 030,						
SS-11		Overside Drains	100, 500			ft		\$	_
SS-11		Streambank Stabilization	100, 300			ft		\$	
00 12		St. Sambanic Stabilization				Ιl		φ	

Subtotal Soil Stabilization BMPs \$ 1,756,000

ID	BEES	Temporary Sediment Control	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost (\$/Unit)	Cost
SC-1	074029	Silt Fence	07-430	Yes	400000	ft	\$5	\$ 2,000,000
SC-2		Sediment/Desilting Basin		No		EA		\$ -
SC-2		Temporary Sediment Basin	07-436	Yes		EA		\$ -
SC-3		Sediment Trap		No		EA		\$ -
SC-4		Check Dam				EA		\$ -
SC-4	074035	Temporary Check Dams	07-415	Yes	20000	ft	\$12	\$ 240,000
SC-5	074028	Fiber Rolls	07-420	Yes	400000	ft	\$6	\$ 2,400,000
SC-6	074031	Gravel Bag Berm	07-470	No		ft		\$ -
SC-7	074041	Street Sweeping and Vacuuming	07-360	No		LS		\$ -
SC-8		Sandbag Barrier		No		ft		\$ -
SC-9	074030	Straw Bale Barrier	07-460	Yes		ft		\$ -
SC-10	074038	Storm Drain Inlet Protection	07-490	Yes	250	EA	\$300	\$ 75,000
	070069	DI Marker and Install DI Marker		Yes		EA		\$ -
	700617	Drainage Inlet Marker	07-015	Yes		EA		\$ -

Subtotal Sediment Control BMPs	\$ 4,715,000
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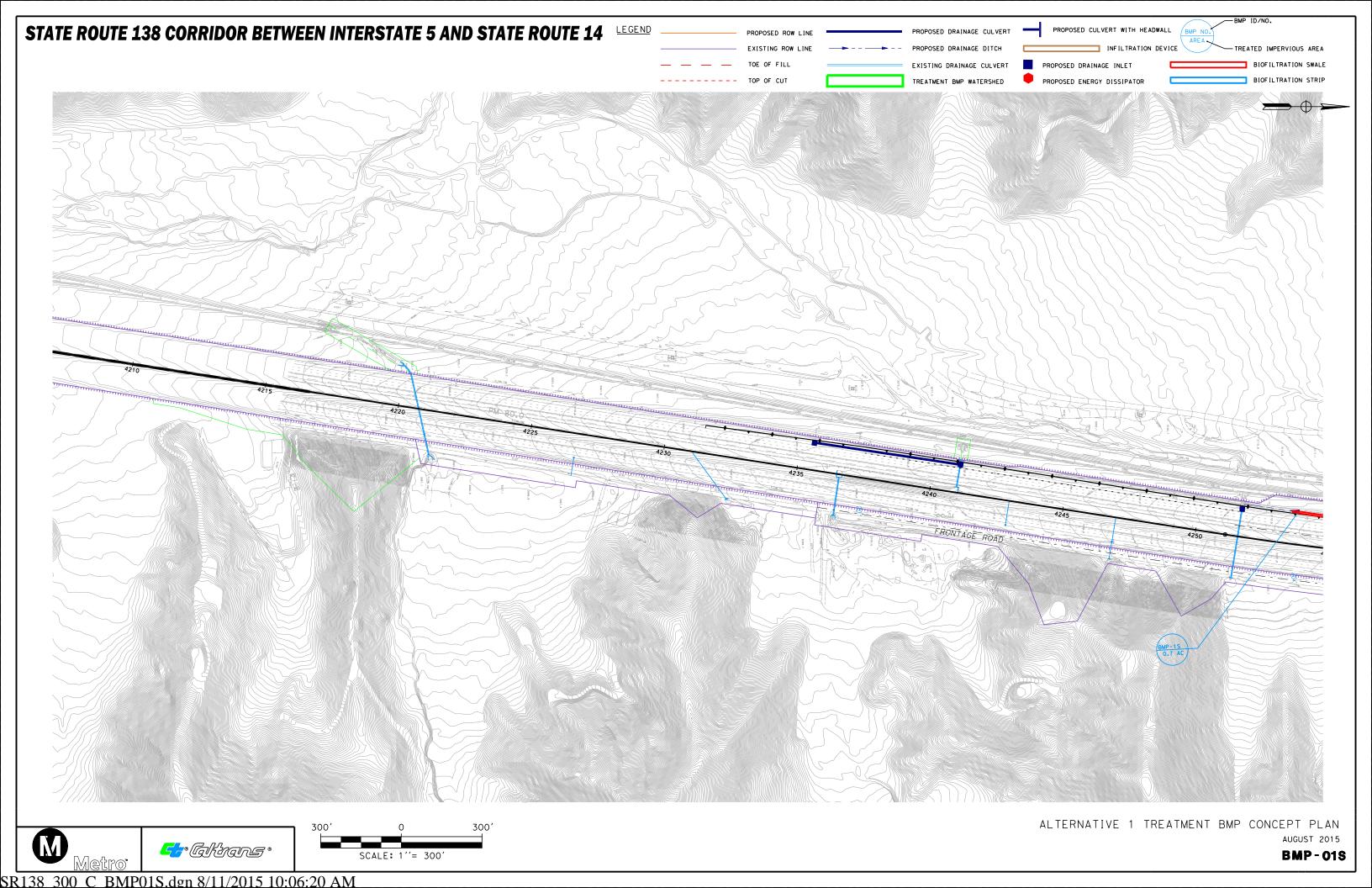
ID	BEES	Temporary Wind Erosion Control	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost (\$/Unit)		Cost
WE-1		Wind Erosion Control		No		LS		\$	-
SS-5		Dust Palliative	18-010	No	5000	ton	500	\$:	2,500,000
SS-7	130570	Temporary Cover	07-395	Yes	100000	SQYD	2	\$	200,000
Subtotal Wind Erosion Control BMPs								\$	2.700.000

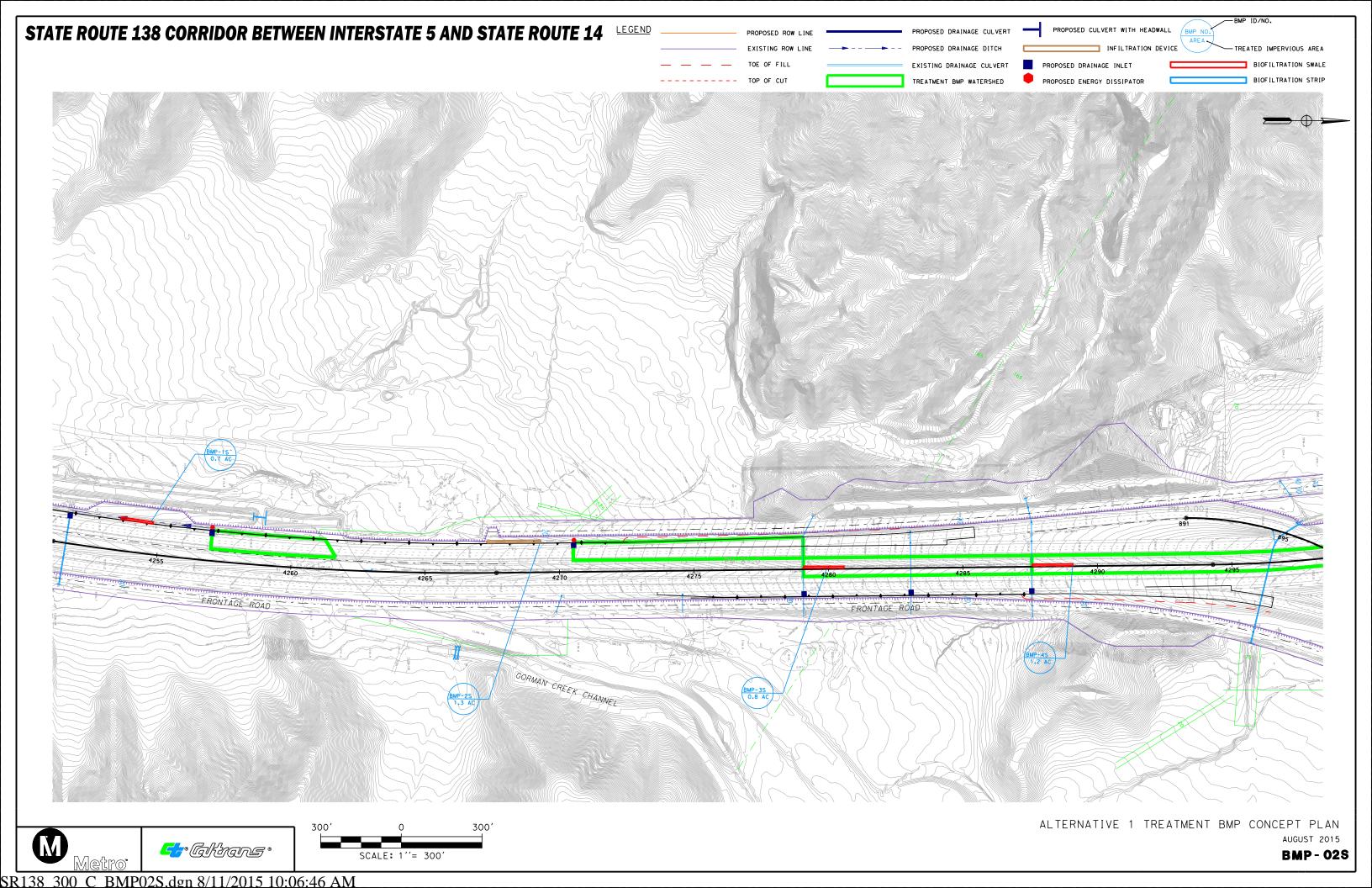
ID	BEES	Temporary Tracking Control	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost (\$/Unit)	Cost
TC-1	074033	Stabilized Constr. Entrance/Exit	07-480	Yes	20	EA	3,000	\$ 60,000
TC-2		Stabilized Construction Roadway	07-481	Yes		LS		\$ -
TC-3		Entrance/Outlet Tire Wash		No		EΑ		\$ -
Subtotal Tracking Control BMPs								\$ 60,000

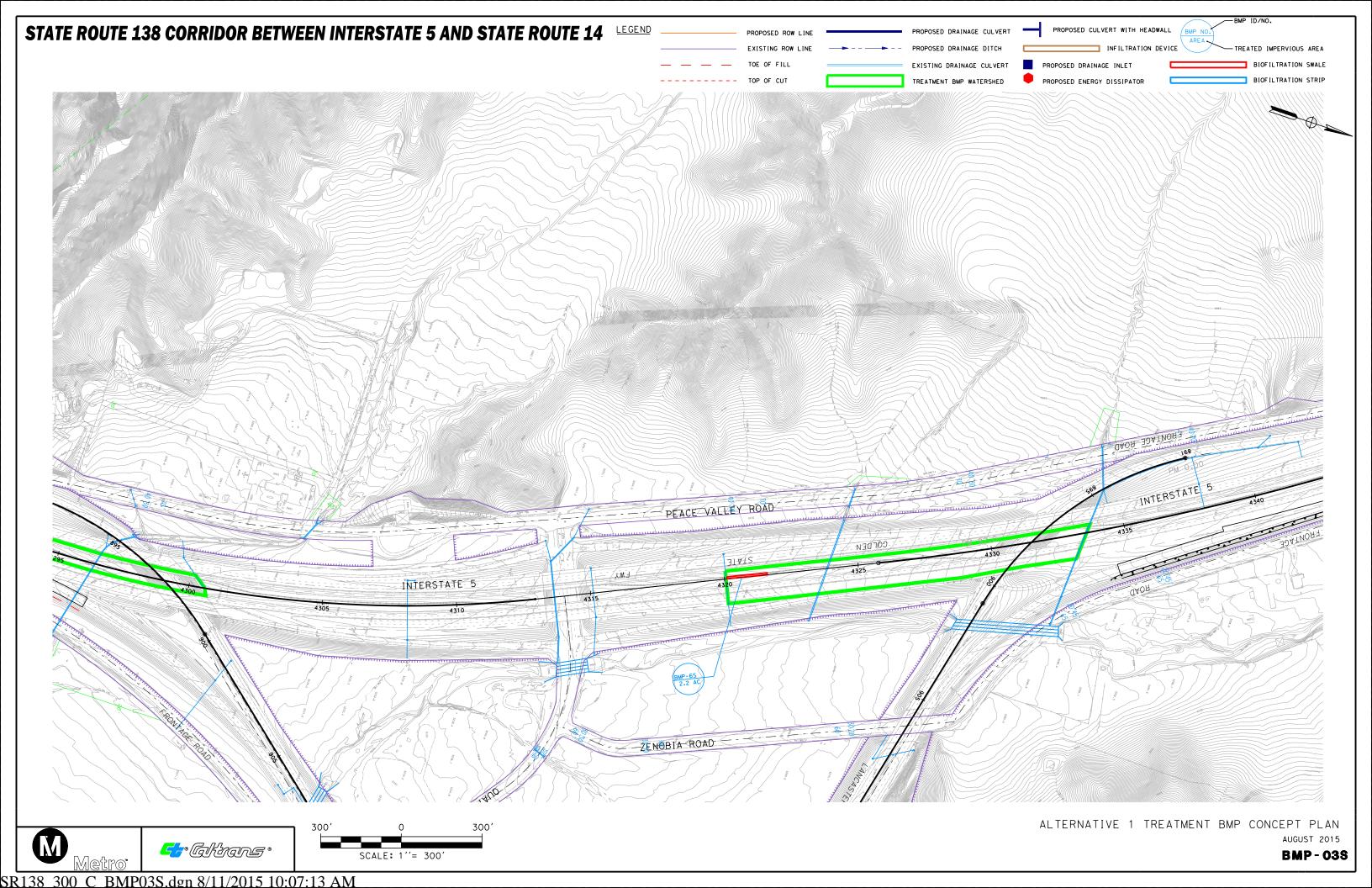
ID	BEES	Temporary Waste Management Control	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost (\$/Unit)		Cost
WM-1	CSM*	Material Delivery and Storage	07-346	No	1	LS	100,000	\$	100,000
WM-2	CSM*	Material Use	07-346	No	1	LS	100,000	\$	100,000
WM-3	CSM*	Stockpile Management	07-346	No	1	LS	100,000	\$	100,000
WM-4	CSM*	Spill Prevention and Control	07-346	No		LS		\$	-
WM-5	CSM*	Solid Waste Management	07-346	No		LS		\$	-
WM-6	CSM*	Hazardous Waste Management	07-346	No		LS		\$	-
WM-7	CSM*	Contaminated Soil Management	07-346	No		LS		\$	-
WM-8		Concrete Waste Management	07-346	No		LS		\$	-
WM-8	074032	Temporary Concrete Washout	07-405	Yes	30	EA	2,000	\$	60,000
WM-8	074042	Temp Conc Washout (Portable)	07-406	No		LS		\$	-
		Grinding PCC (Displ of PCC Pavemt Grooving & Grinding Residues)	42-600	No		LS		\$	-
WM-9	CSM*	Sanitary/Septic Waste Managemt	07-346	No		LS		\$	-
WM-10	CSM*	Liquid Waste Management	07-346	No		LS		\$	-
Subtotal Waste Management & Materials Handling BMPs									

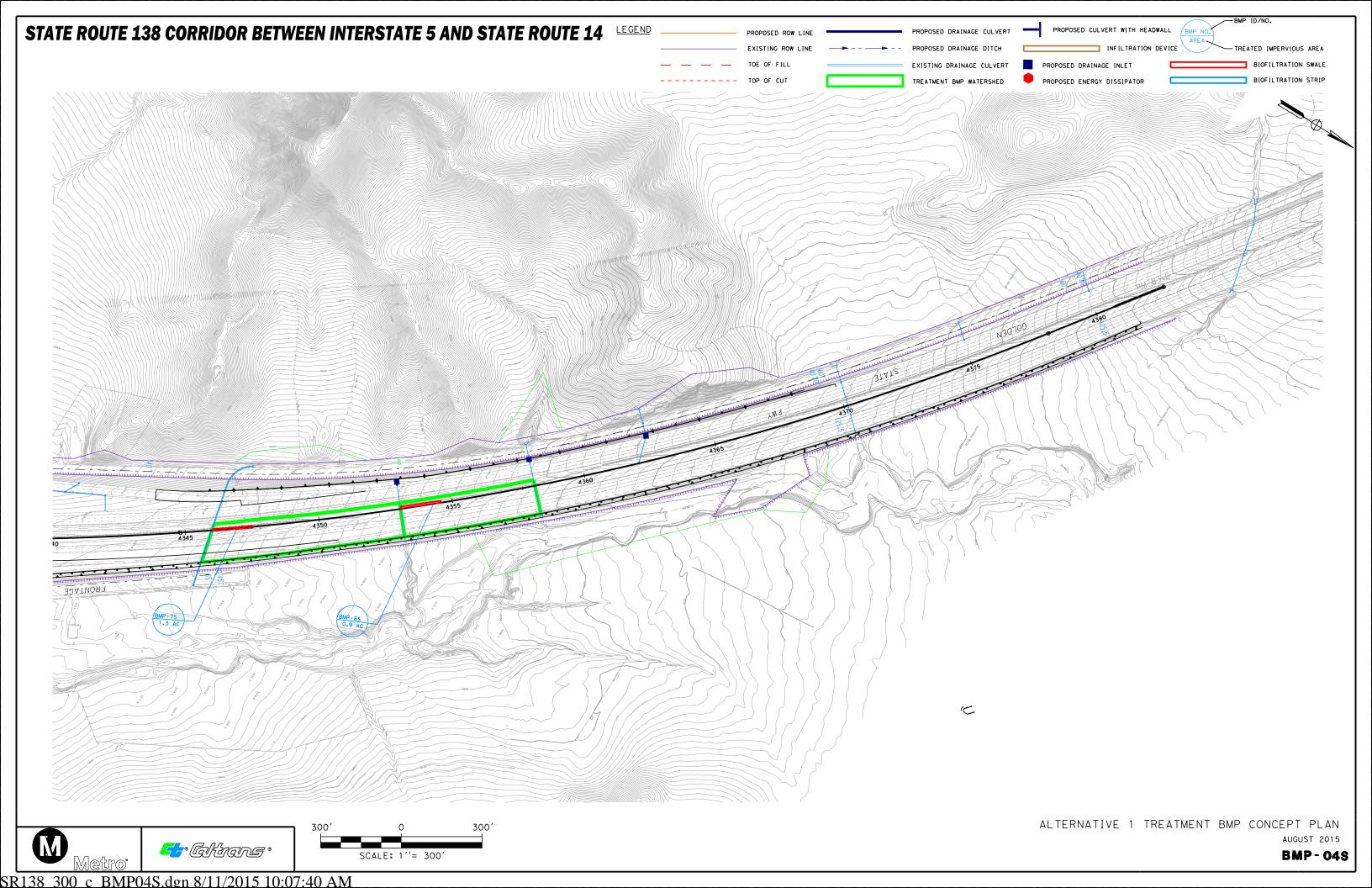
ID	BEES	Temporary Non-Storm Water Management	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost (\$/Unit)		Cost
NS-1	CSM*	Water Conservation Practices	07-346	No		LS		\$	-
NS-2	CSM*	Dewatering Operations	07-341	No		LS		\$	-
NS-3	CSM*	Paving & Grinding Operations				LS		\$	-
		Pavements	S5-250	No		ft ²		\$	-
NS-4		Temporary Stream Crossing	07-495	No		LS		\$	-
NS-5		Clear Water Diversion		No		LS		\$	-
NS-6	CSM*	Illicit Connection/Illegal Discharge Detection and Reporting	07-346	No		LS		\$	-
NS-7	CSM*	Potable Water/Irrigation	07-346	No		LS		\$	-
NS-8	CSM*	Vehicle and Equipment Cleaning	07-346	No		LS		\$	-
NS-9	CSM*	Vehicle and Equipment Fueling	07-346	No		LS		\$	-
NS-10	CSM*	Vehicle and Equipmt Maintenance	07-346	No		LS		\$	-
NS-11	CSM*	Pile Driving Operations	07-346	No		LS		\$	-
NS-12	CSM*	Concrete Curing	07-346	No		LS		\$	-
NS-13	CSM*	Material & Equipmt use over water	07-346	No		LS		\$	
NS-14	CSM*	Concrete Finishing	07-346	No		LS		\$	
NS-15	CSM*	Structure Demolition/Removal Over or Adjacent to Water	07-346	No		LS		\$	-
NS-16		Temporary Batch Plants				LS		\$	-
NS-17		Streambank Stabilization				LS		\$	-
	CSM*	*Construction Site Management	07-346	No	1	LS	1,000,000	\$	1,000,000
	Subtotal Non-Storm Water Management								

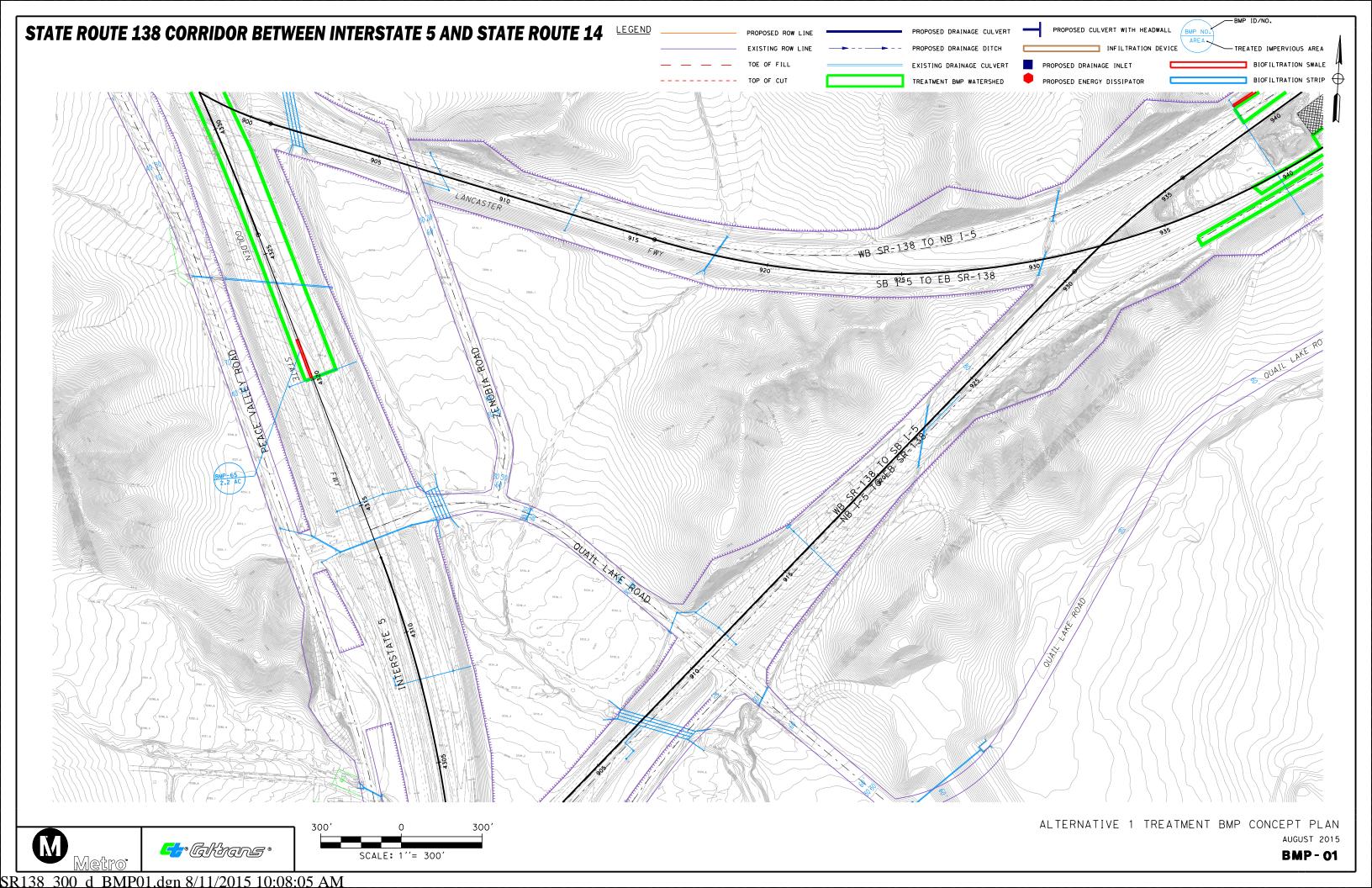
ID	BEES	Miscellaneous Items	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost (\$/Unit)		Cost
		Prepare Water Pollution Control							
	074017	Program	07-340	No		LS		\$	-
		Prepare Storm Water Pollution							
	074019	Prevention Plan	07-345	No	1	LS	320,000	\$	320,000
	074020	Water Pollution Control				LS		\$	-
	066596	Additional Water Pollution Control			1	LS	6,000	\$	6,000
		Water Pollution Control Maintenance							
	066595	Sharing			1	LS	473,750	\$	473,750
	066597	Storm Water Sampling and Analysis		No	1	LS	6,000	\$	6,000
	74056	Rain Event Action Plan		No	1	LS	30,500	\$	30,500
	74057	Storm Water Annual Report			4	EA	2,000	\$	8,000
		Payments (< 1 acre)	S5-250			LS		\$	-
		Rock Blanket	20-080			LS		\$	-
		Slope Protection	72-010			LS		\$	-
		Slope Paving	72-200			LS		\$	-
		Temporary Sand Bag Barrier	07-???			LS		\$	-
		Temporary Sediment Basin	07-???			LS		\$	-
	074058	Storm Water Sampling and Analysis I	_		1	LS	3,000	\$	3,000
	37 1000	Sterm Trater Camping and Analysis I					0,000	۳	0,000
		Temporary Creek Diversion System	07-???			LS		\$	-
		Relations w/RWQCB	S5-630			LS		\$	-
		Order of Work	05-020			LS		\$	-
	Subtotal Miscellaneous Items								847,250

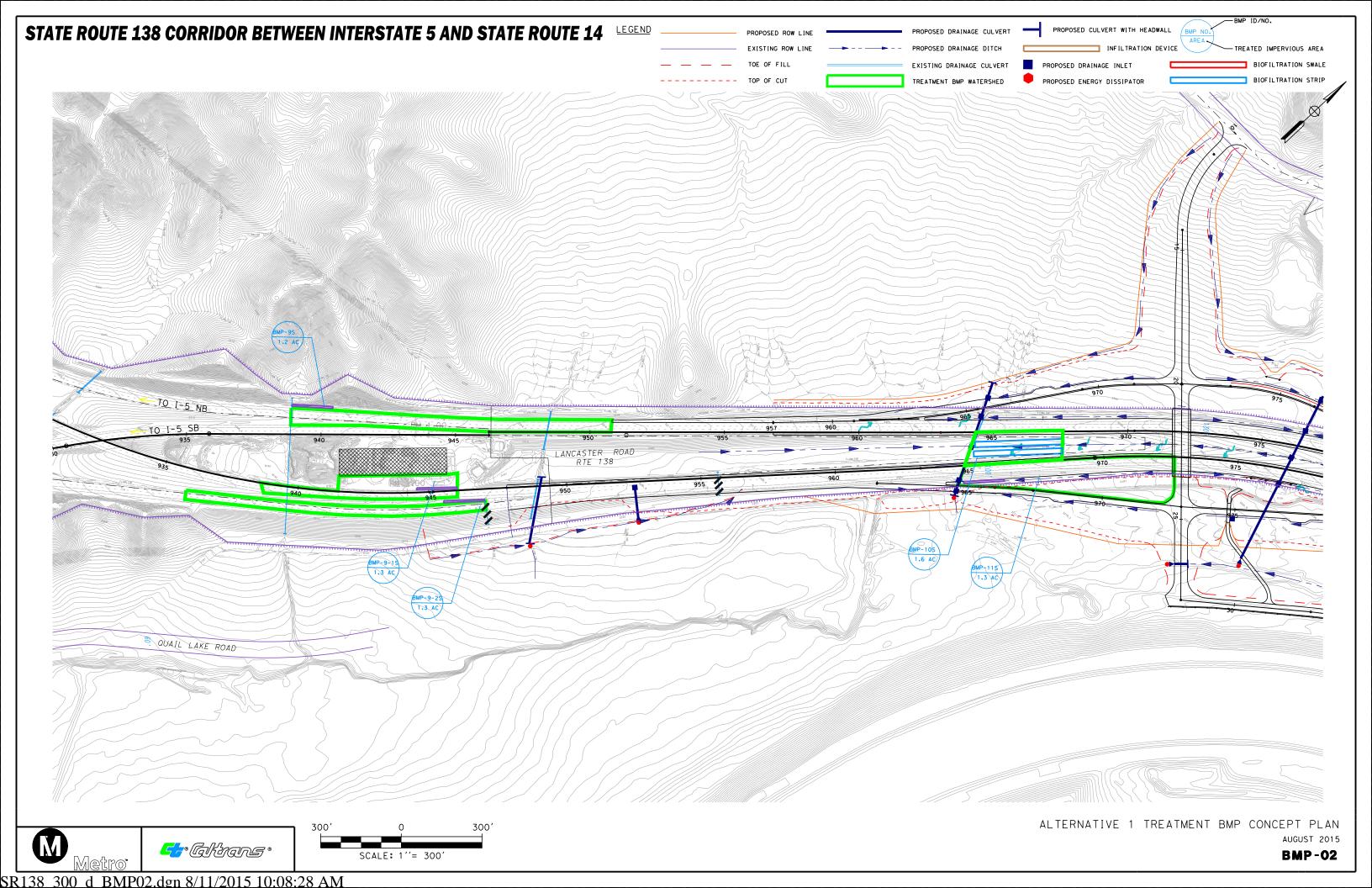


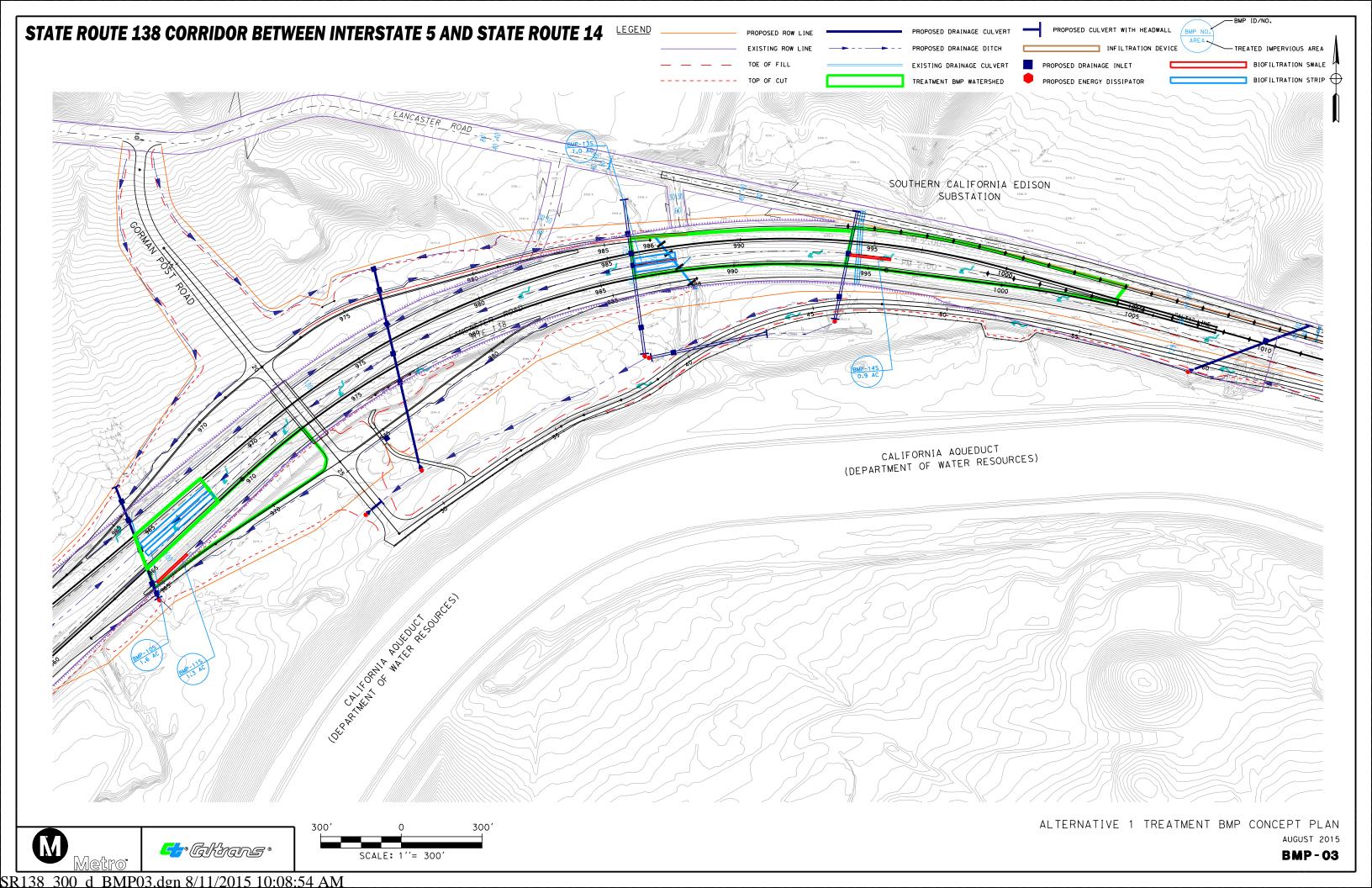


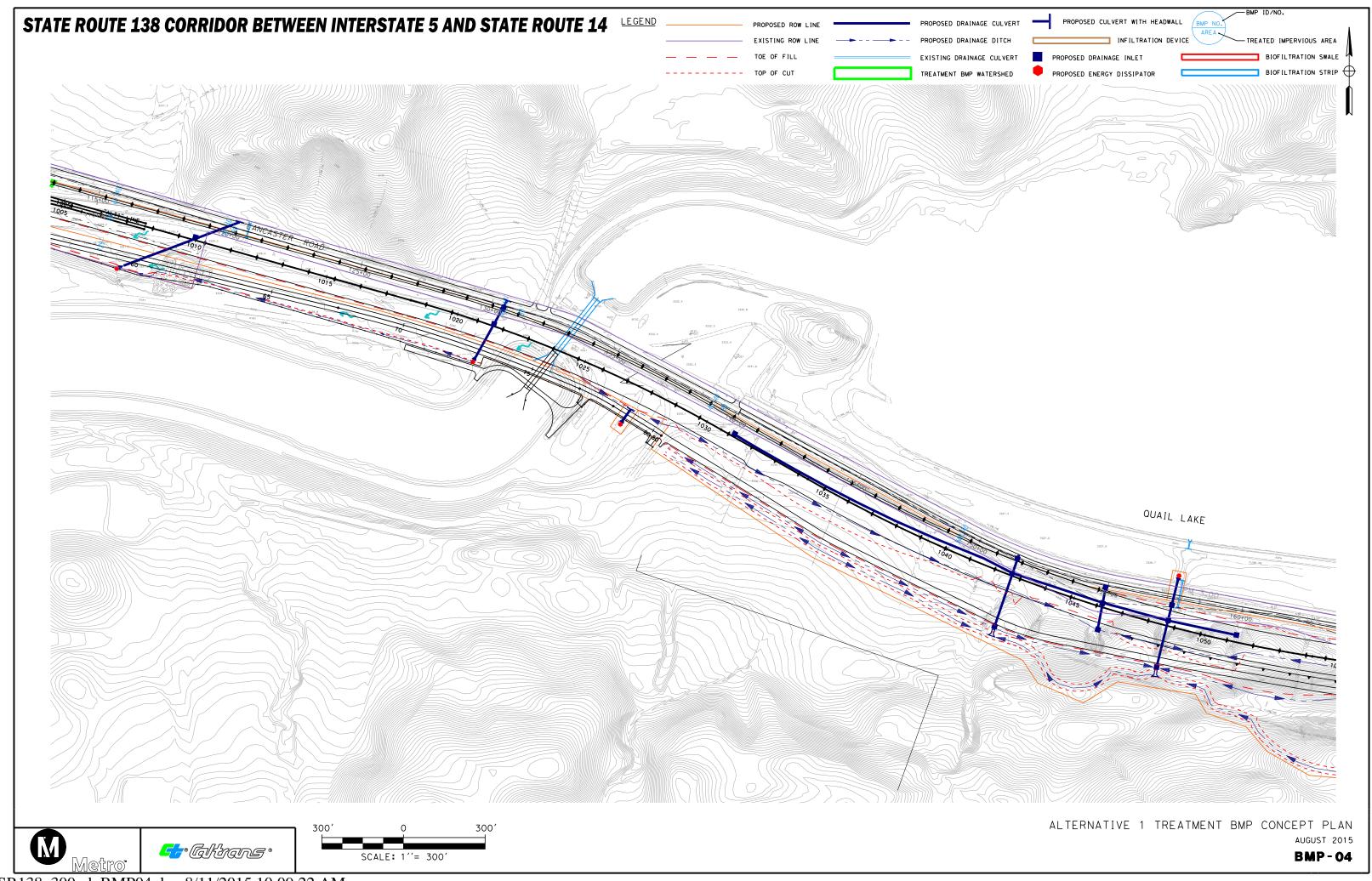


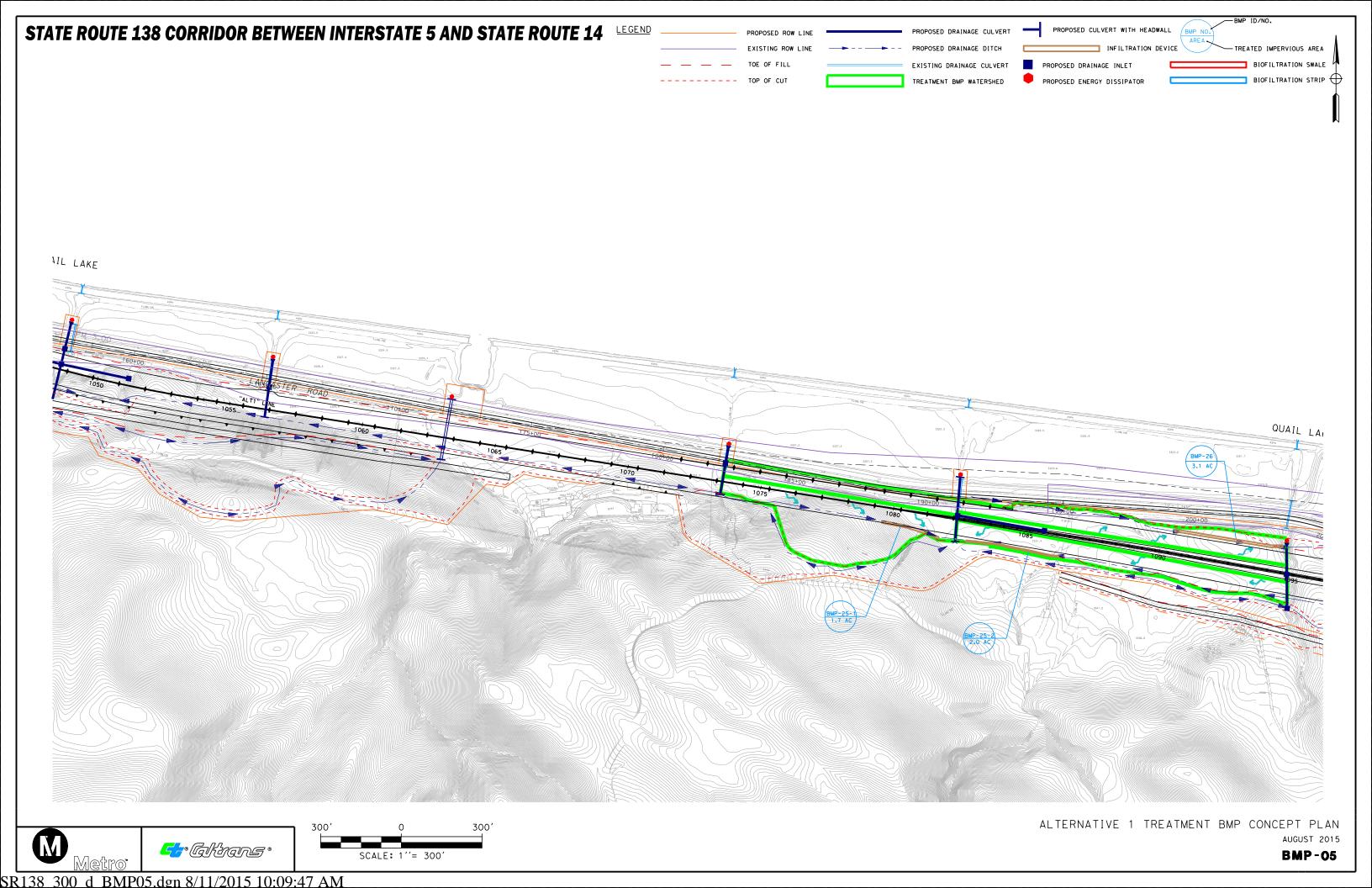


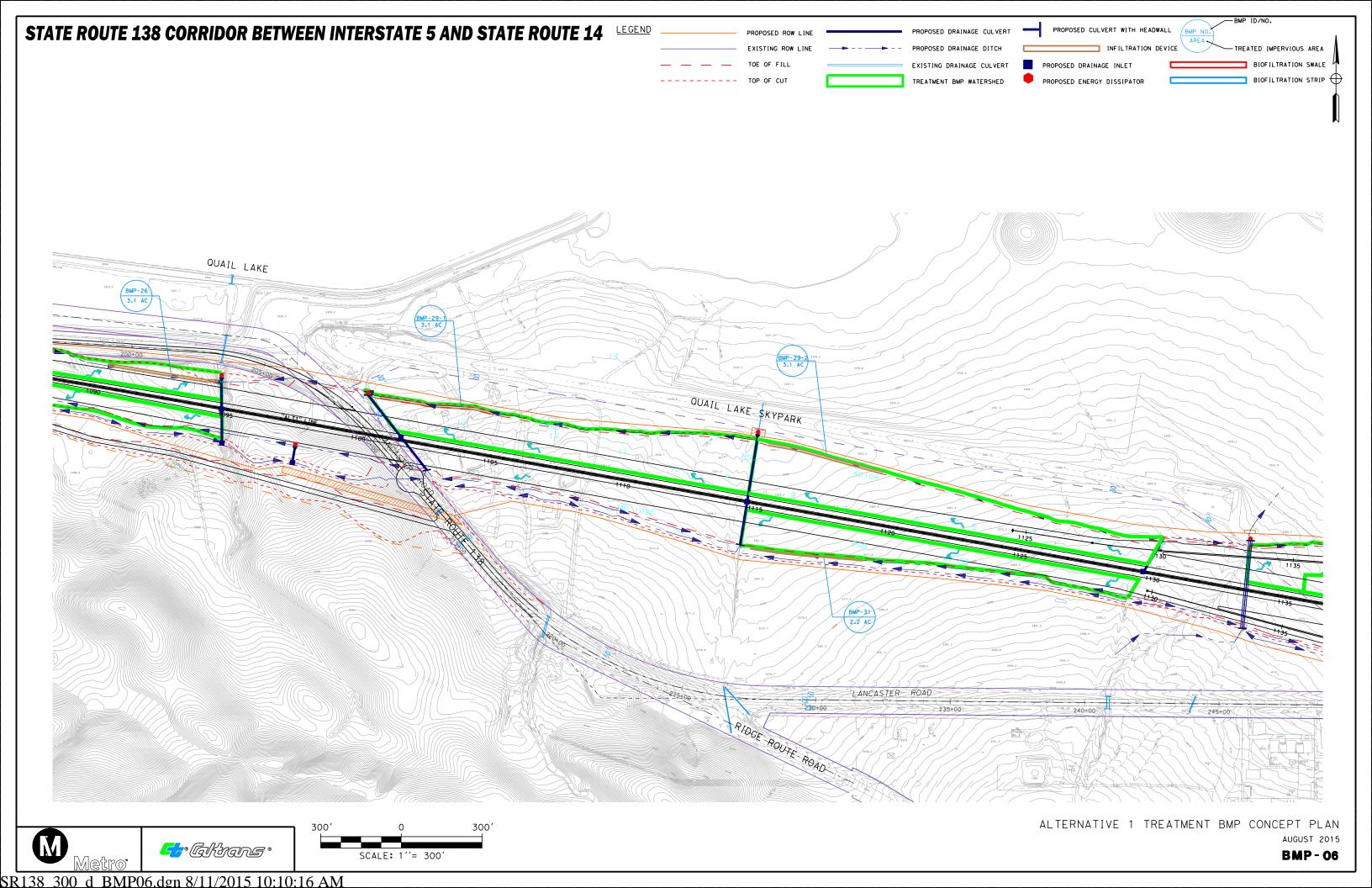


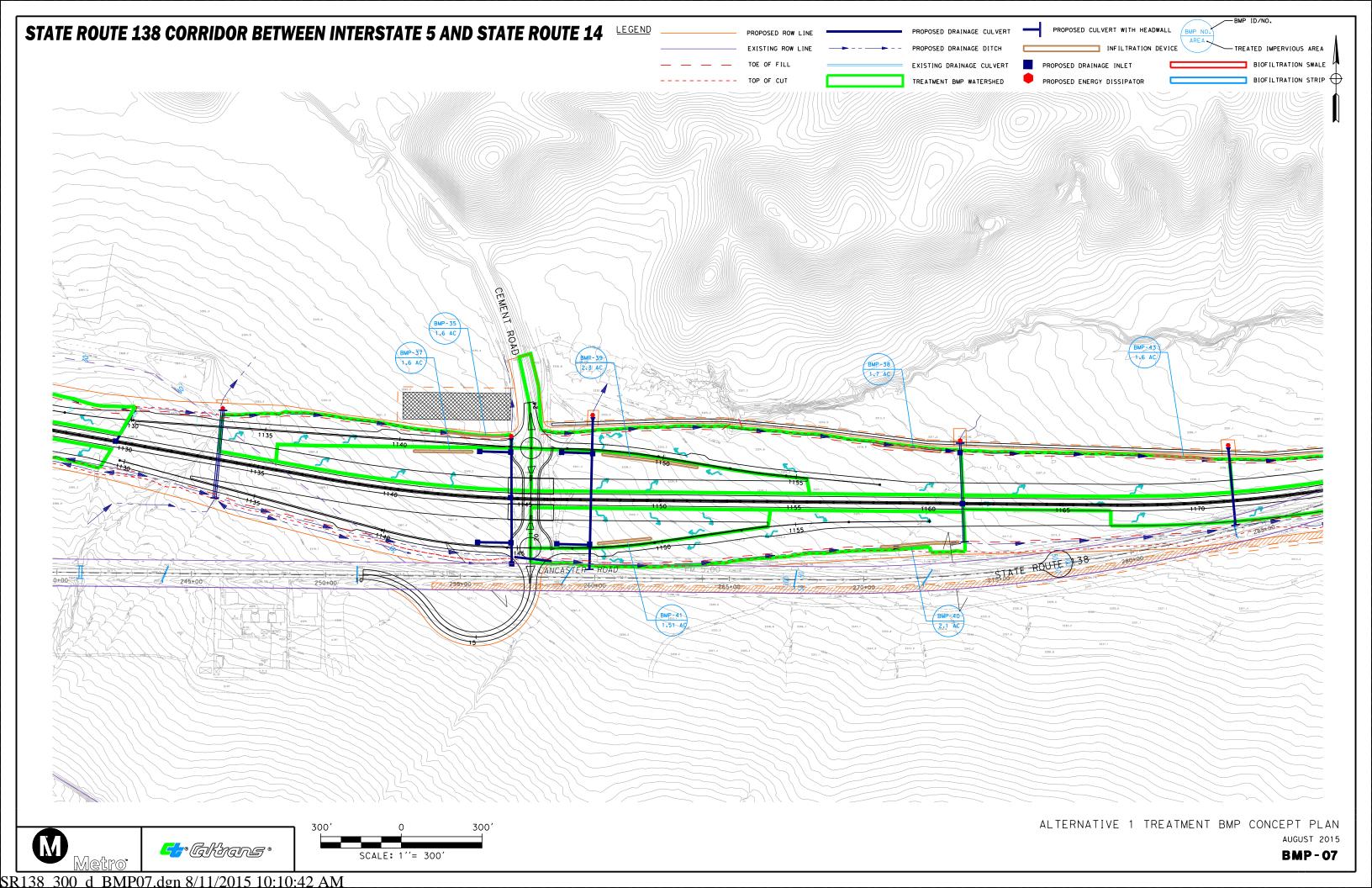


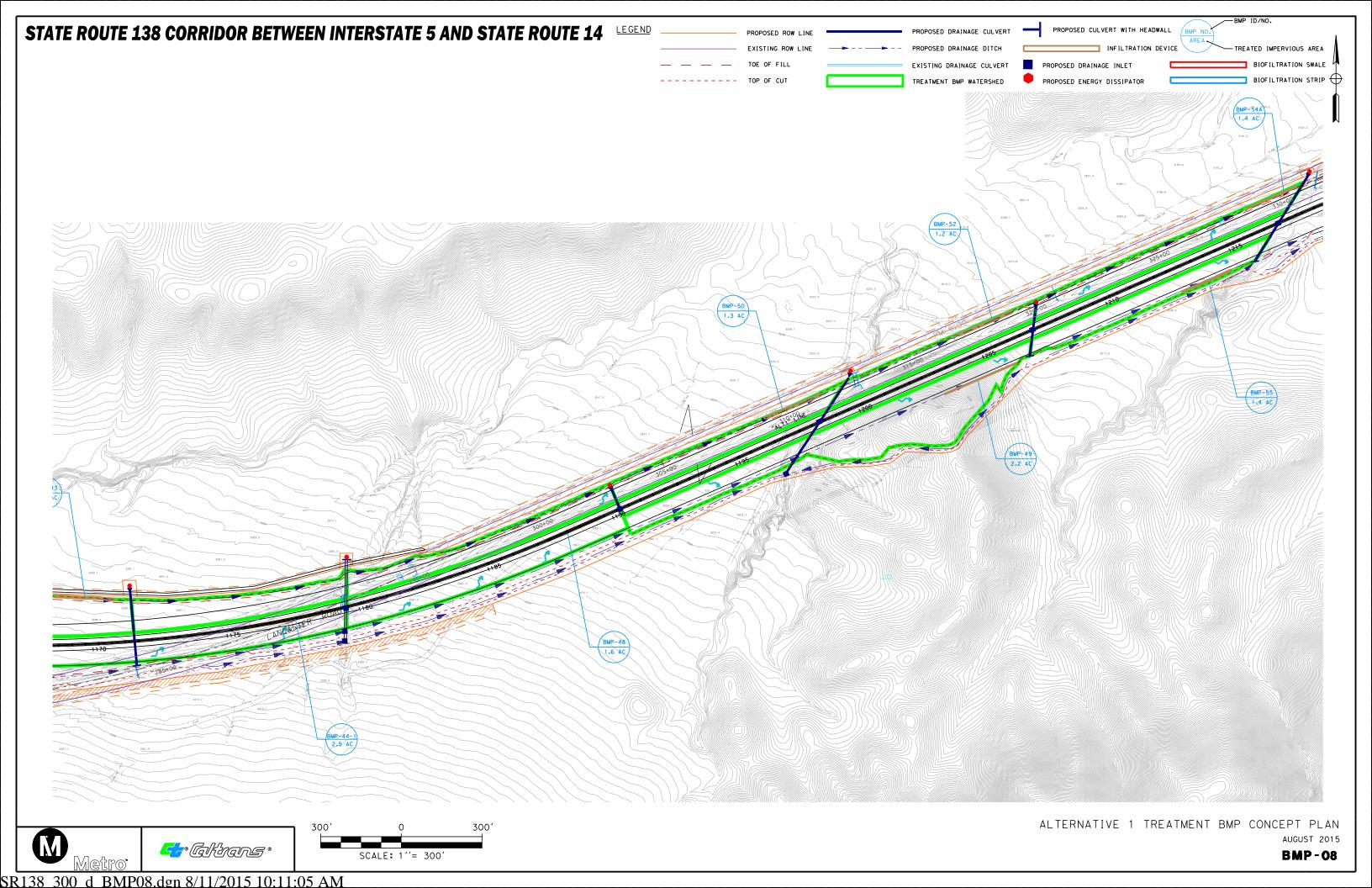


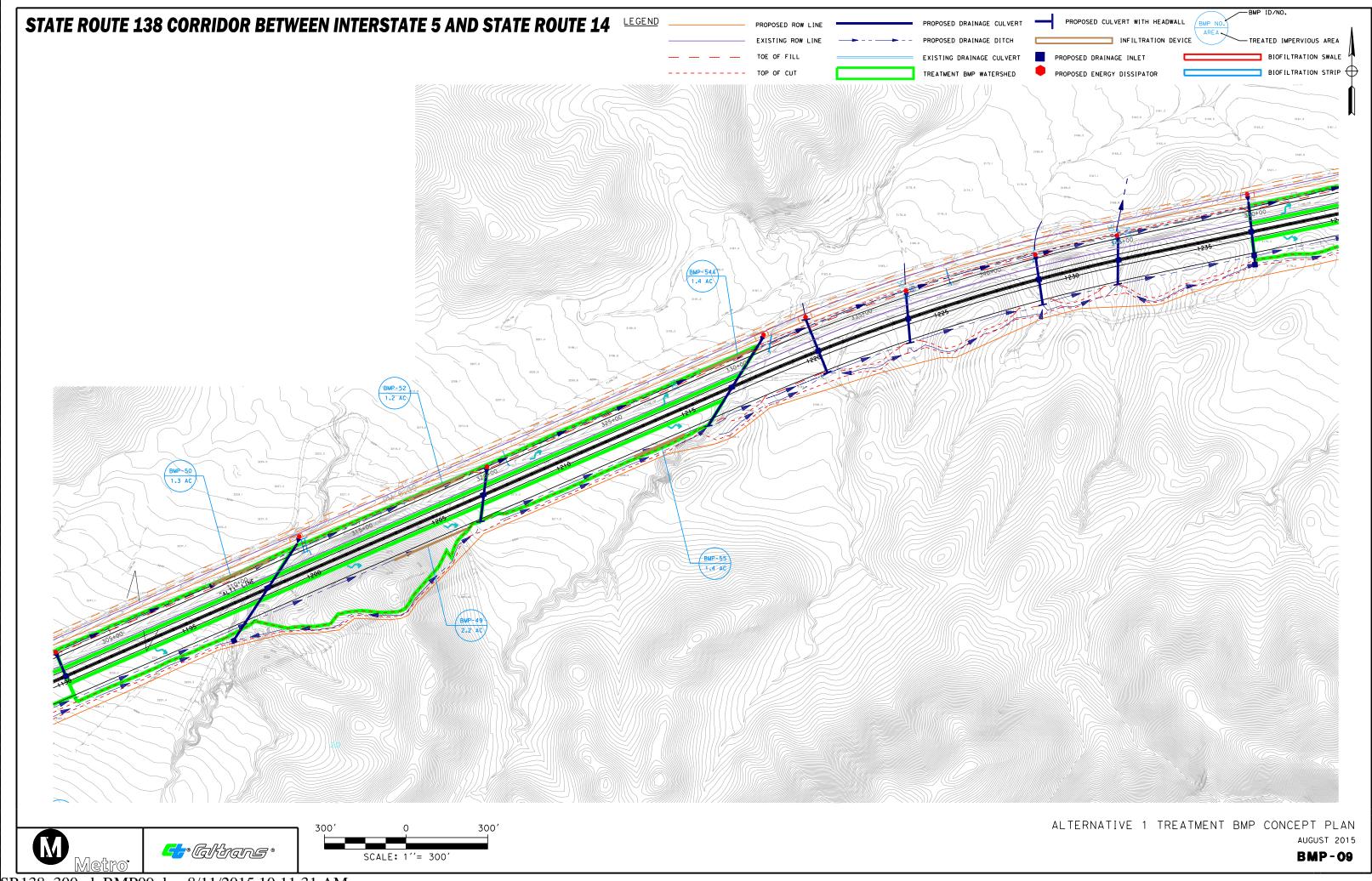


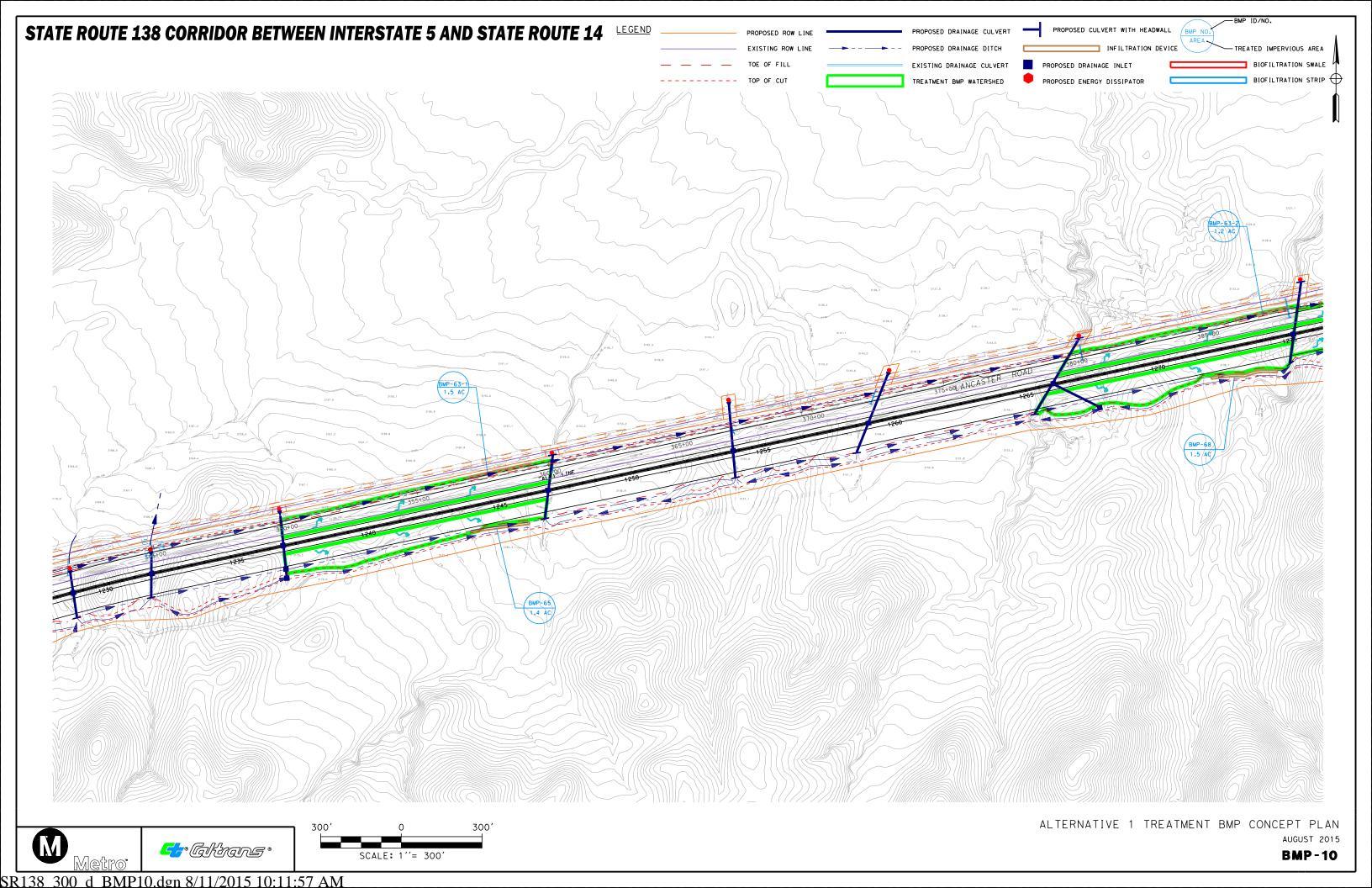


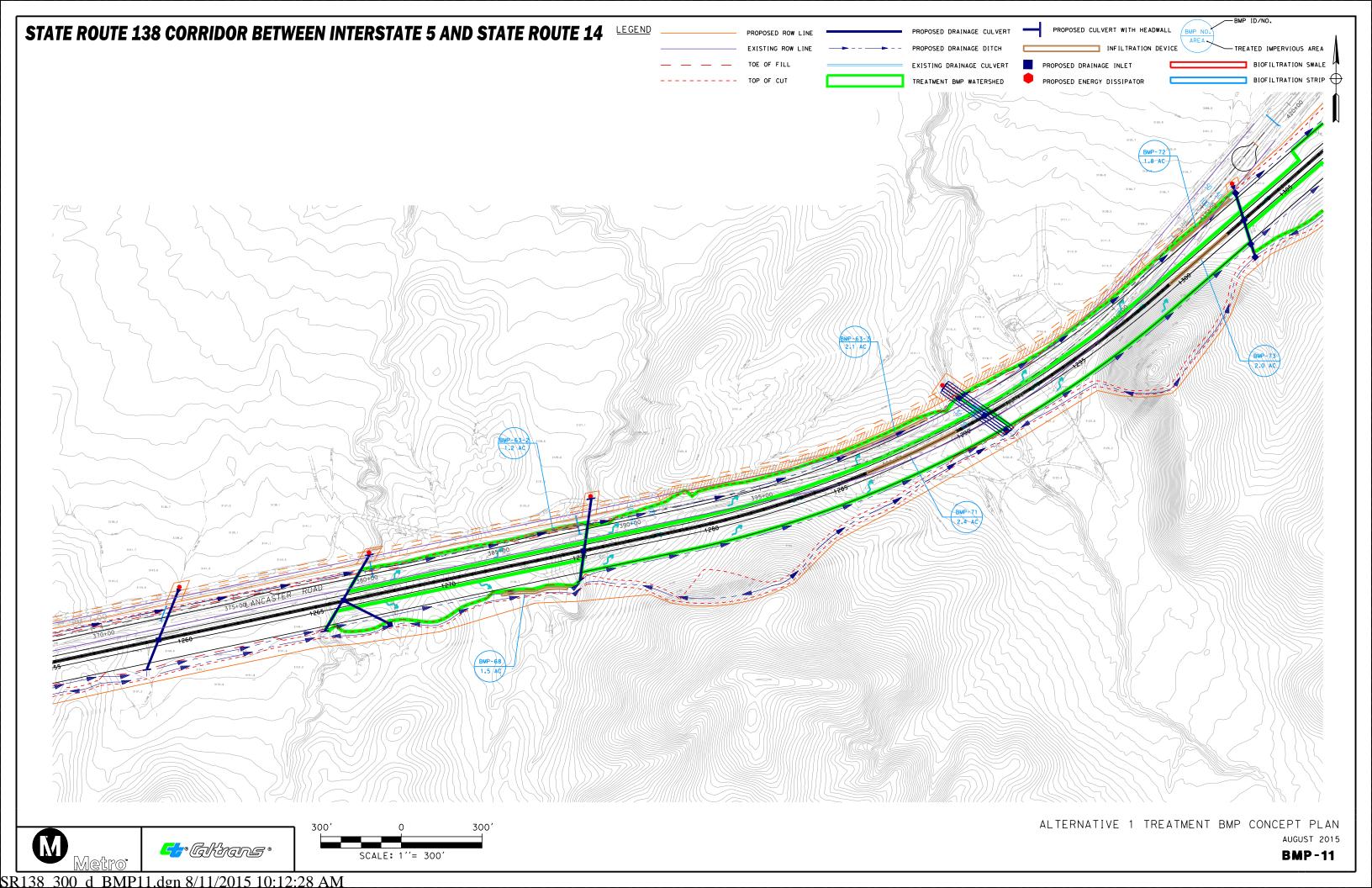


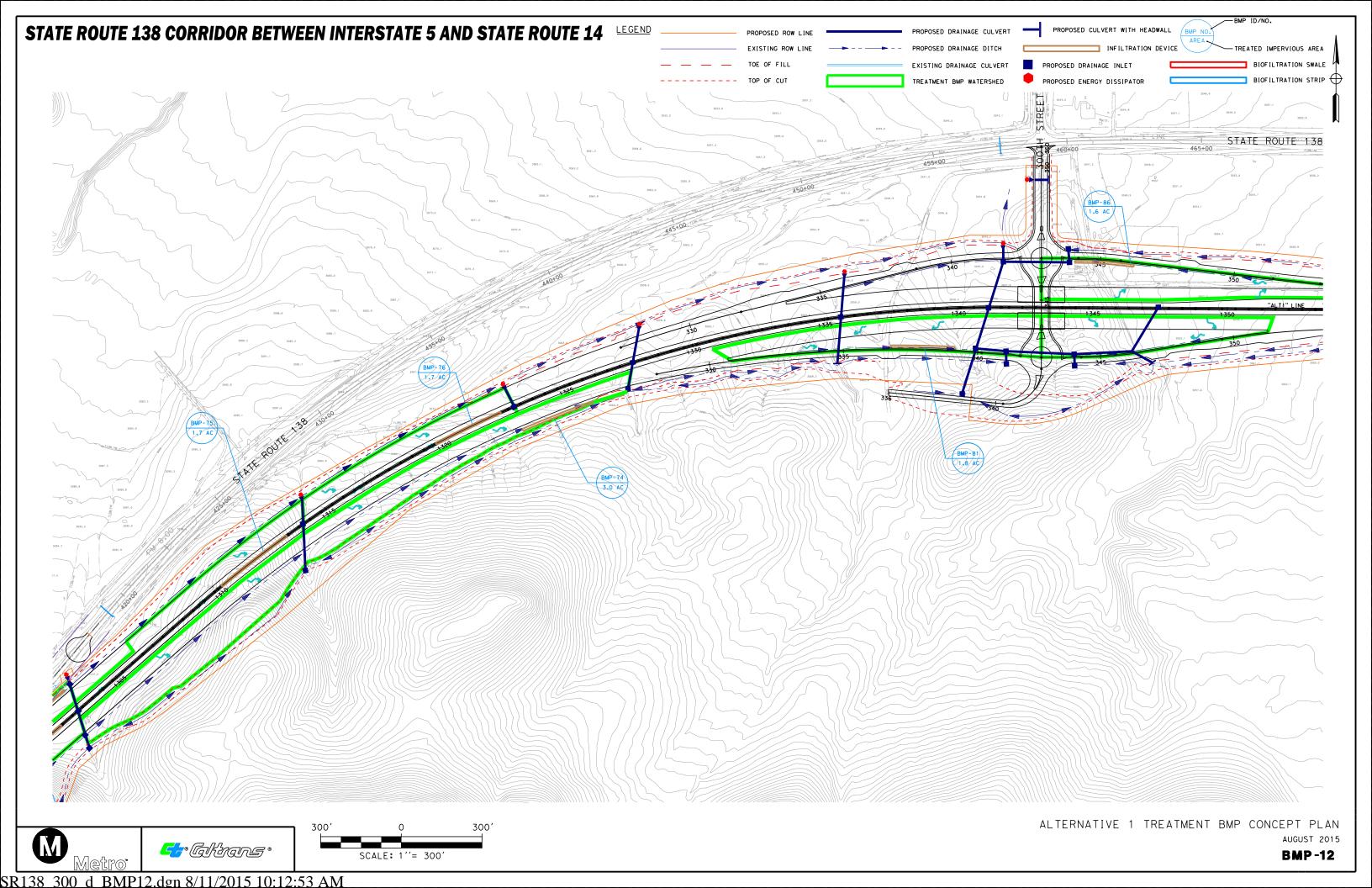


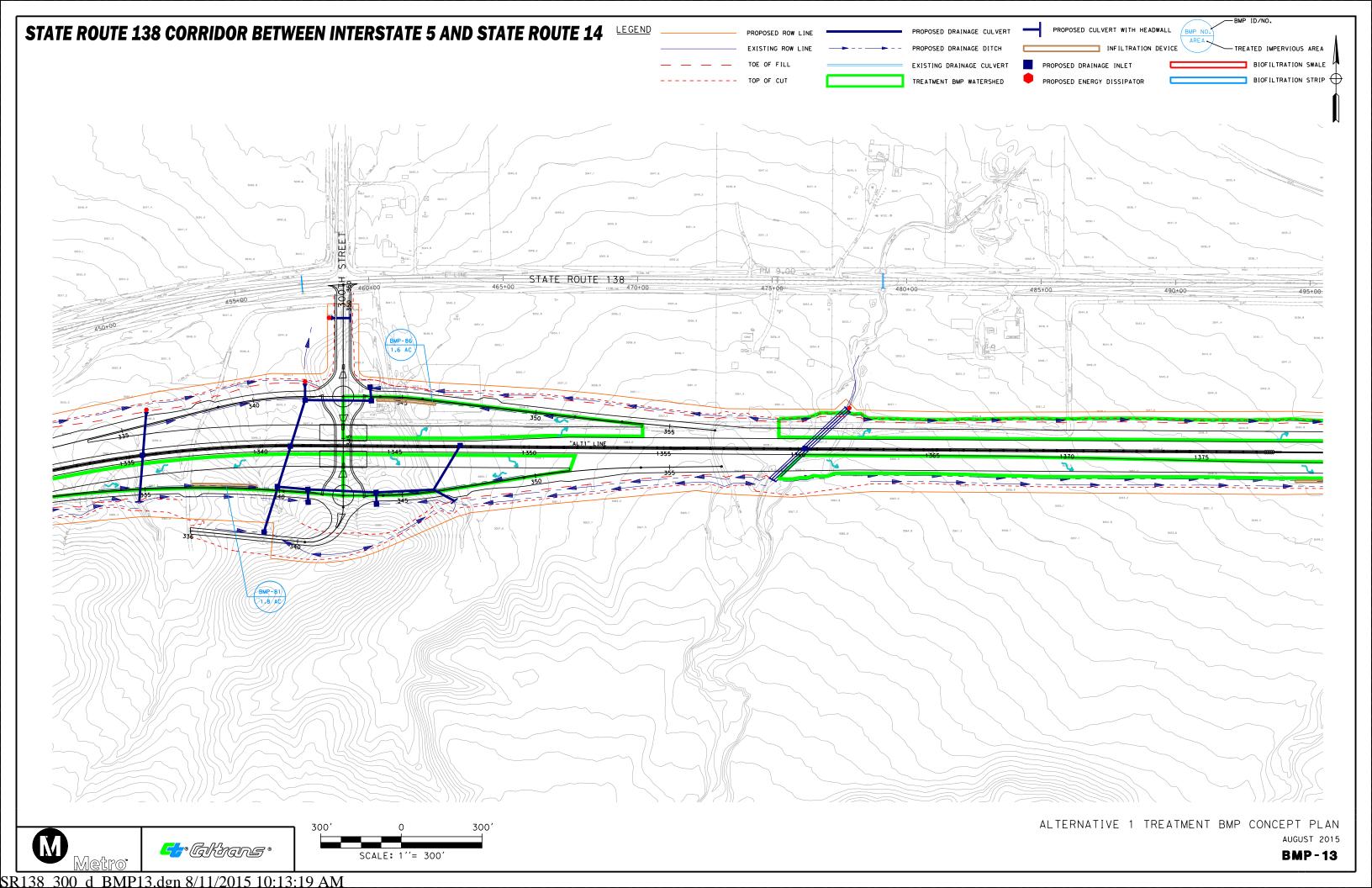


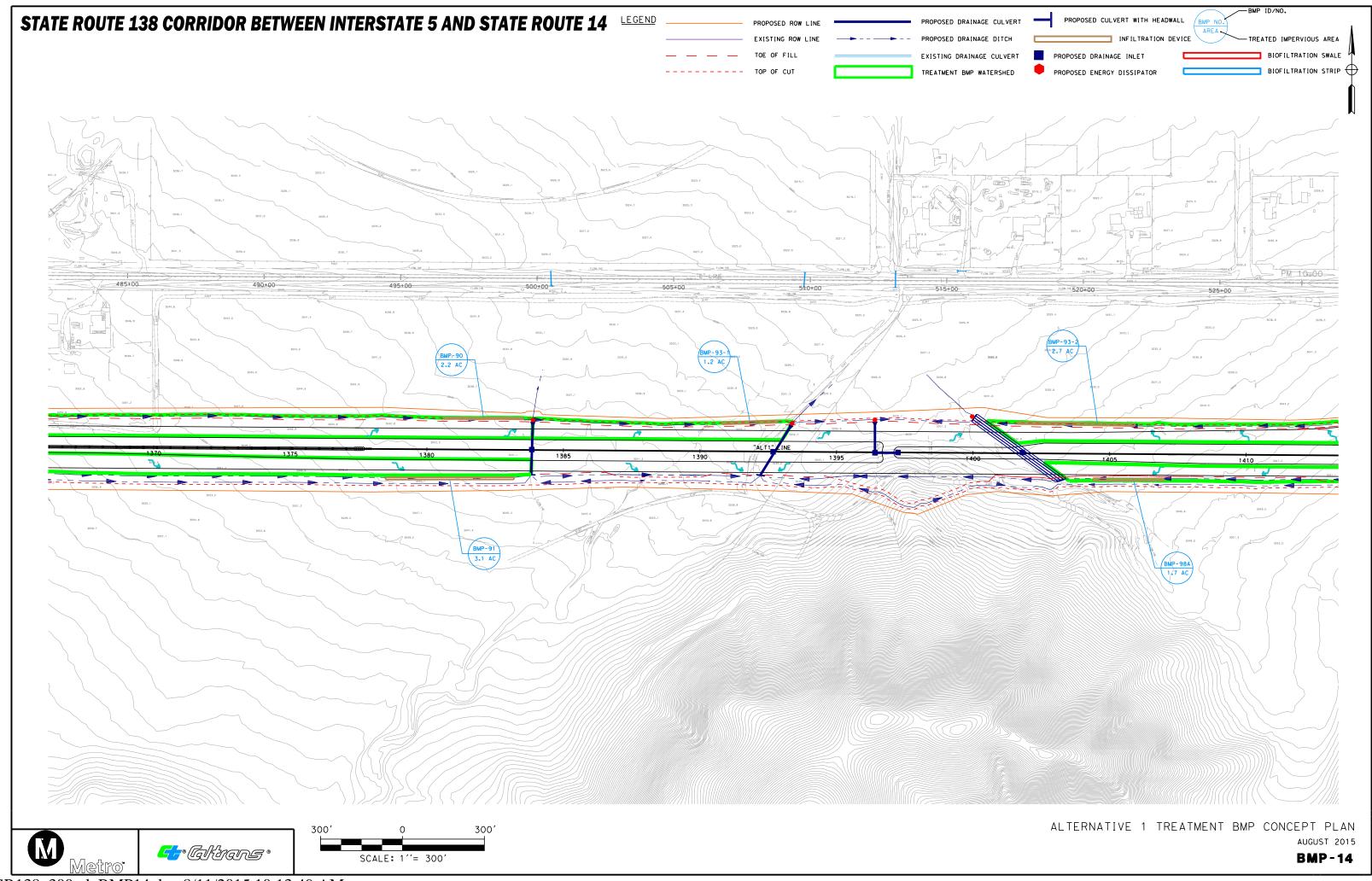


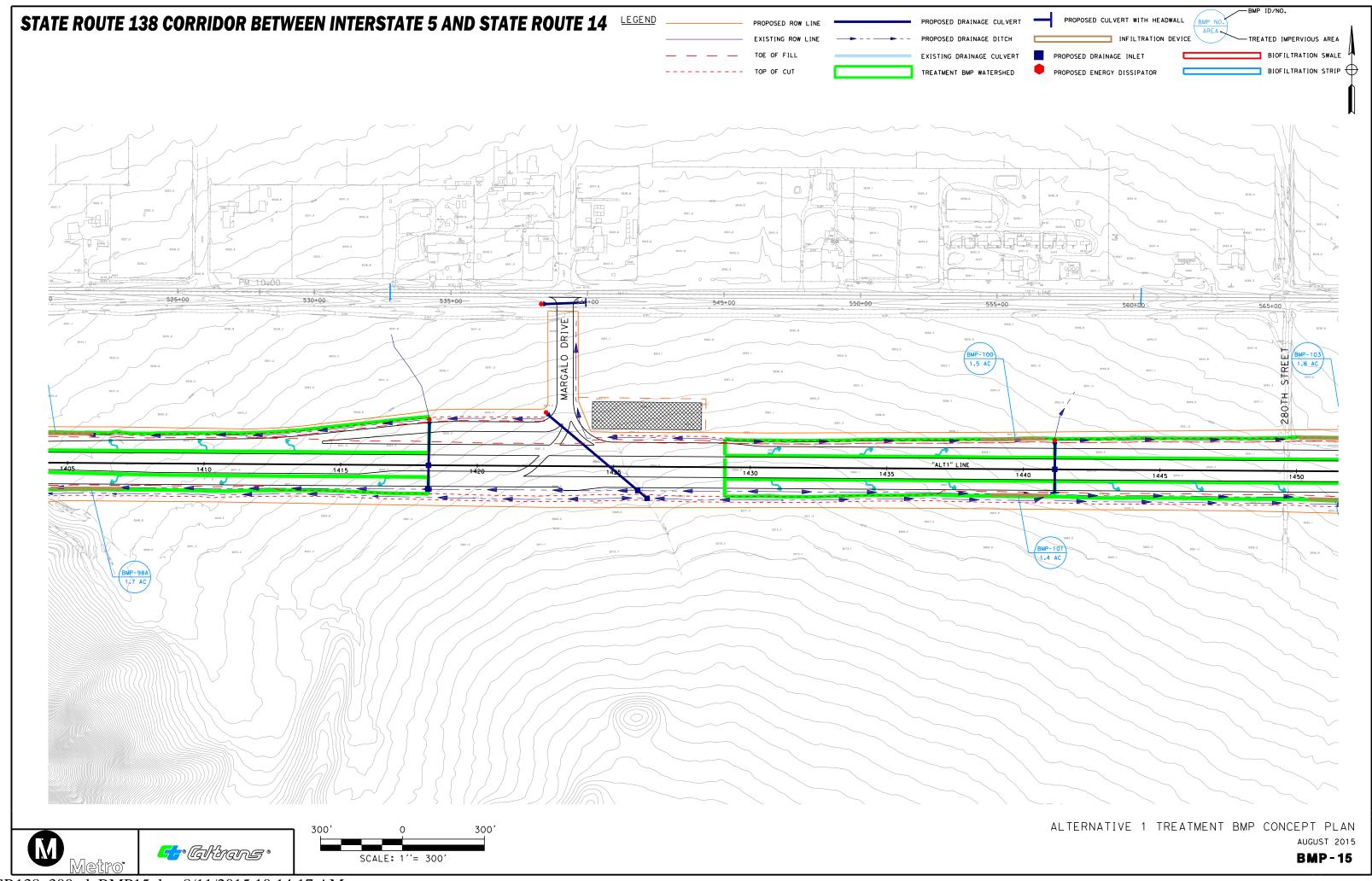


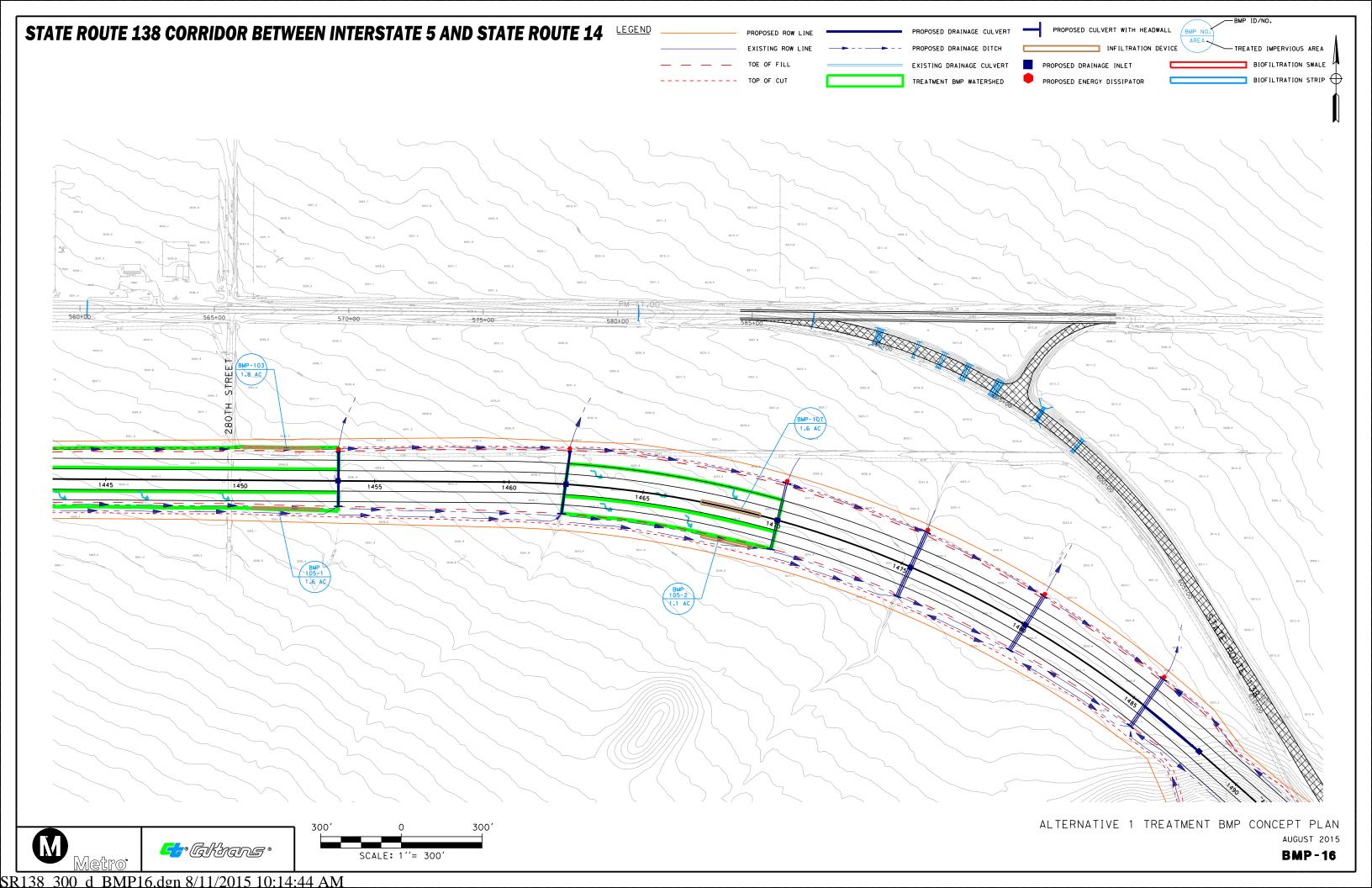


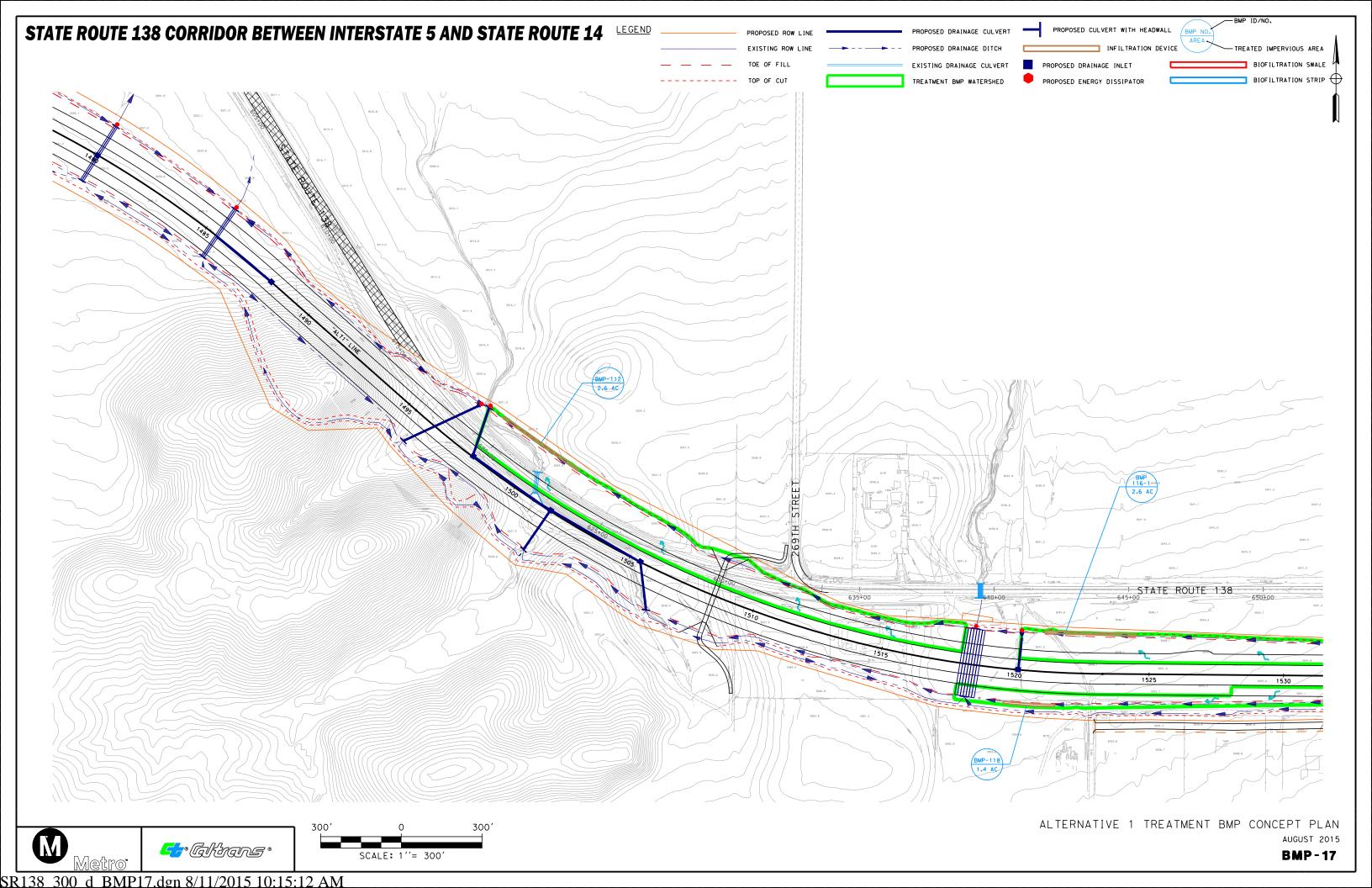


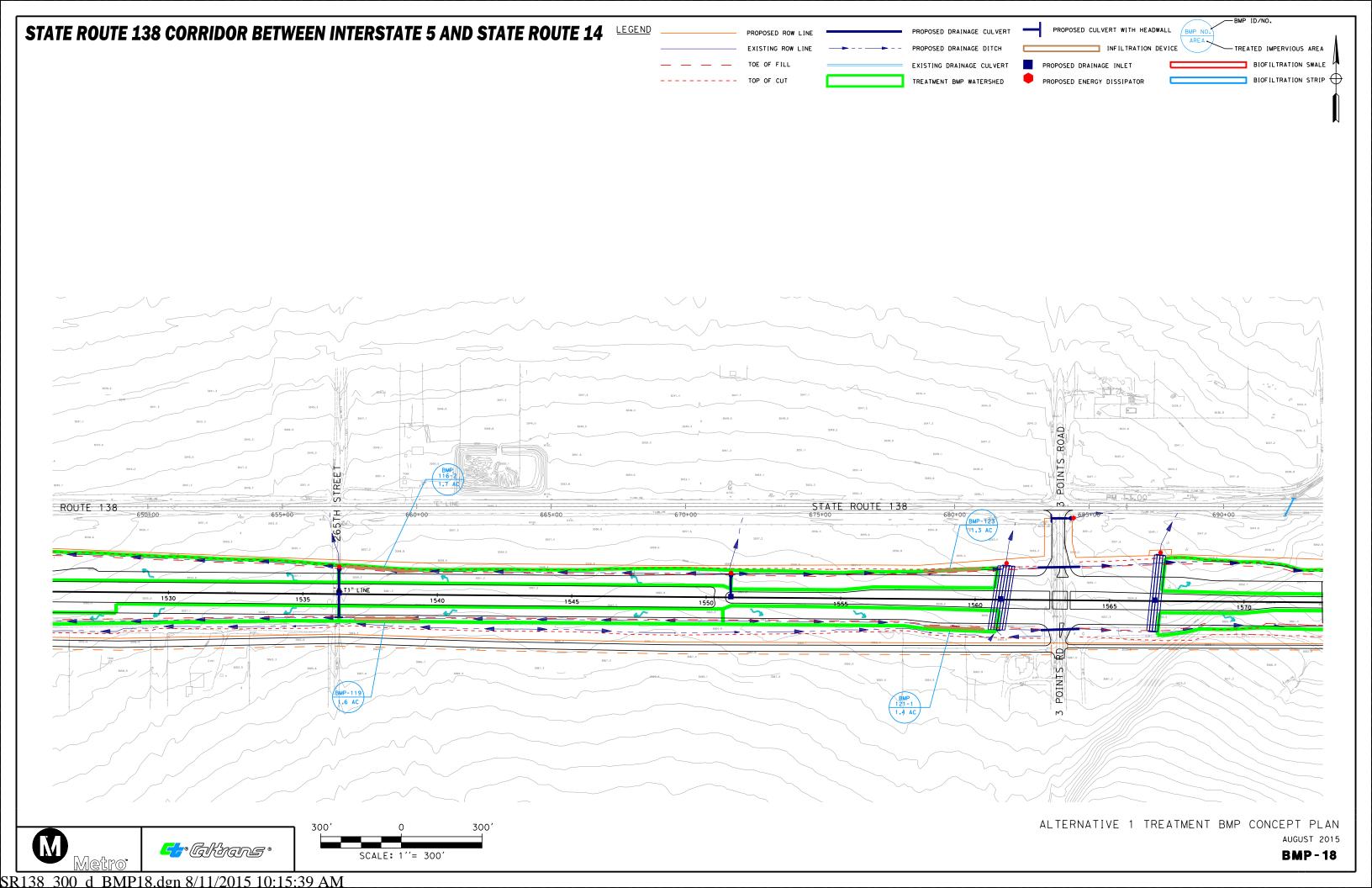


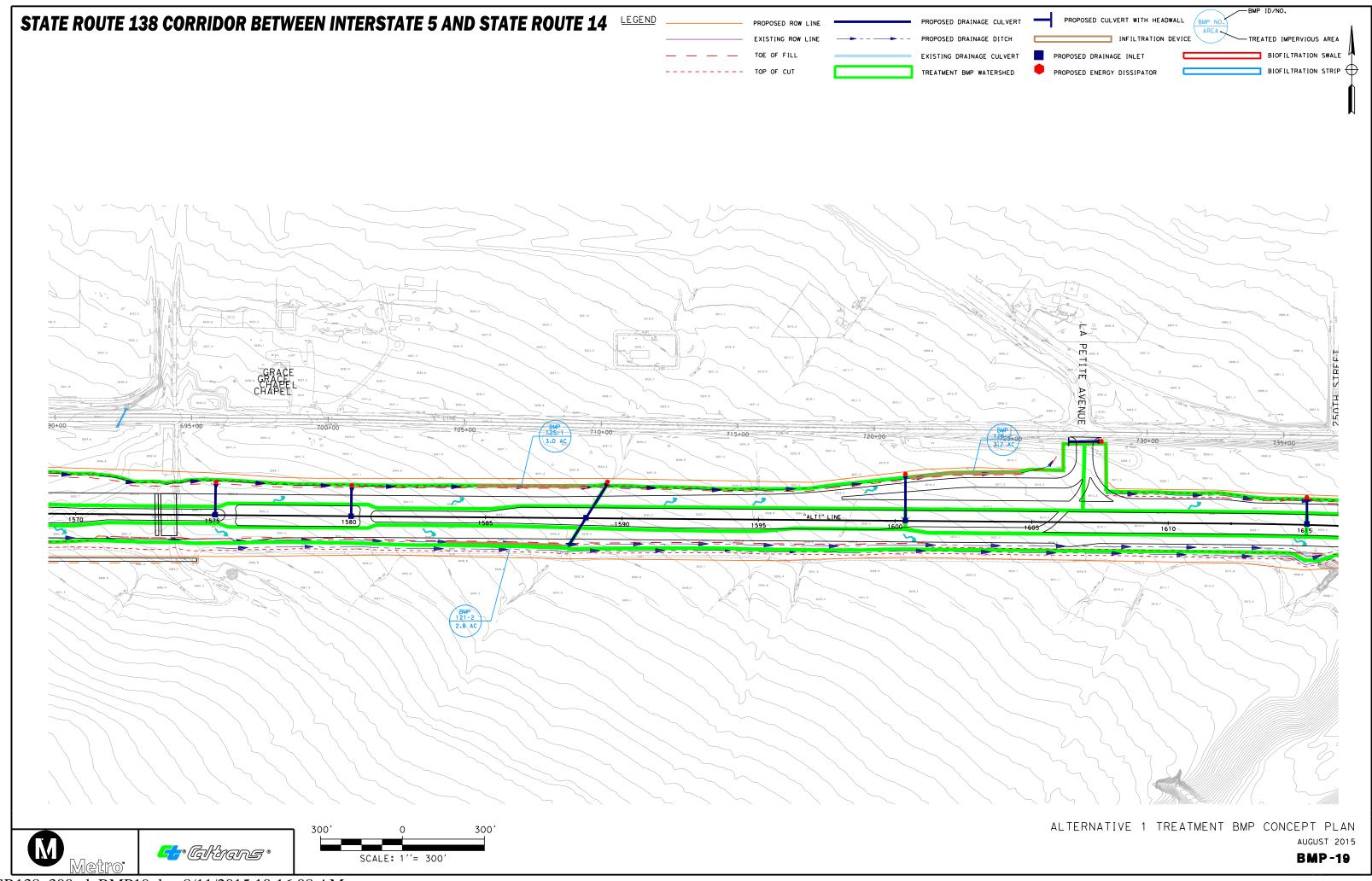


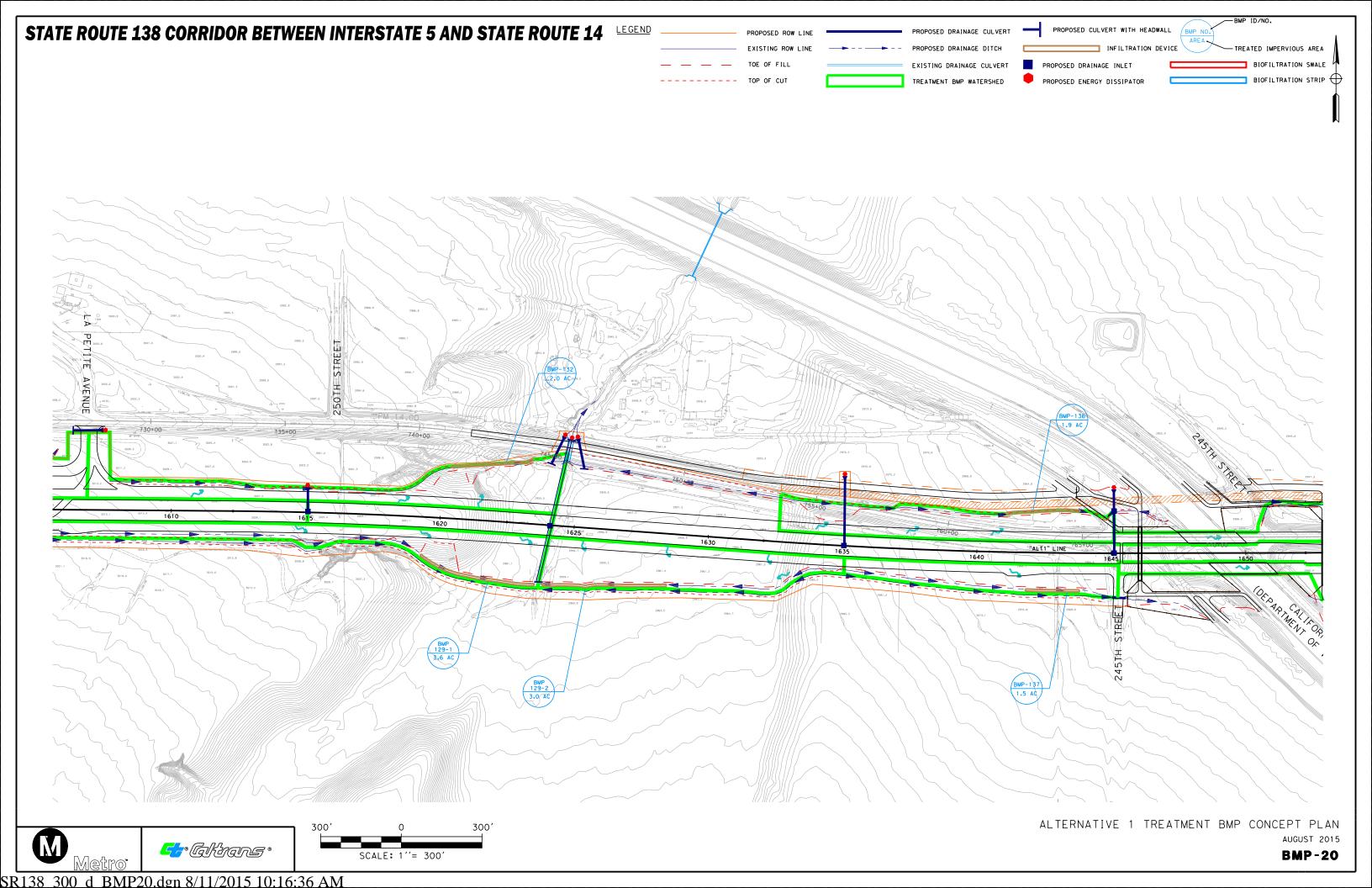


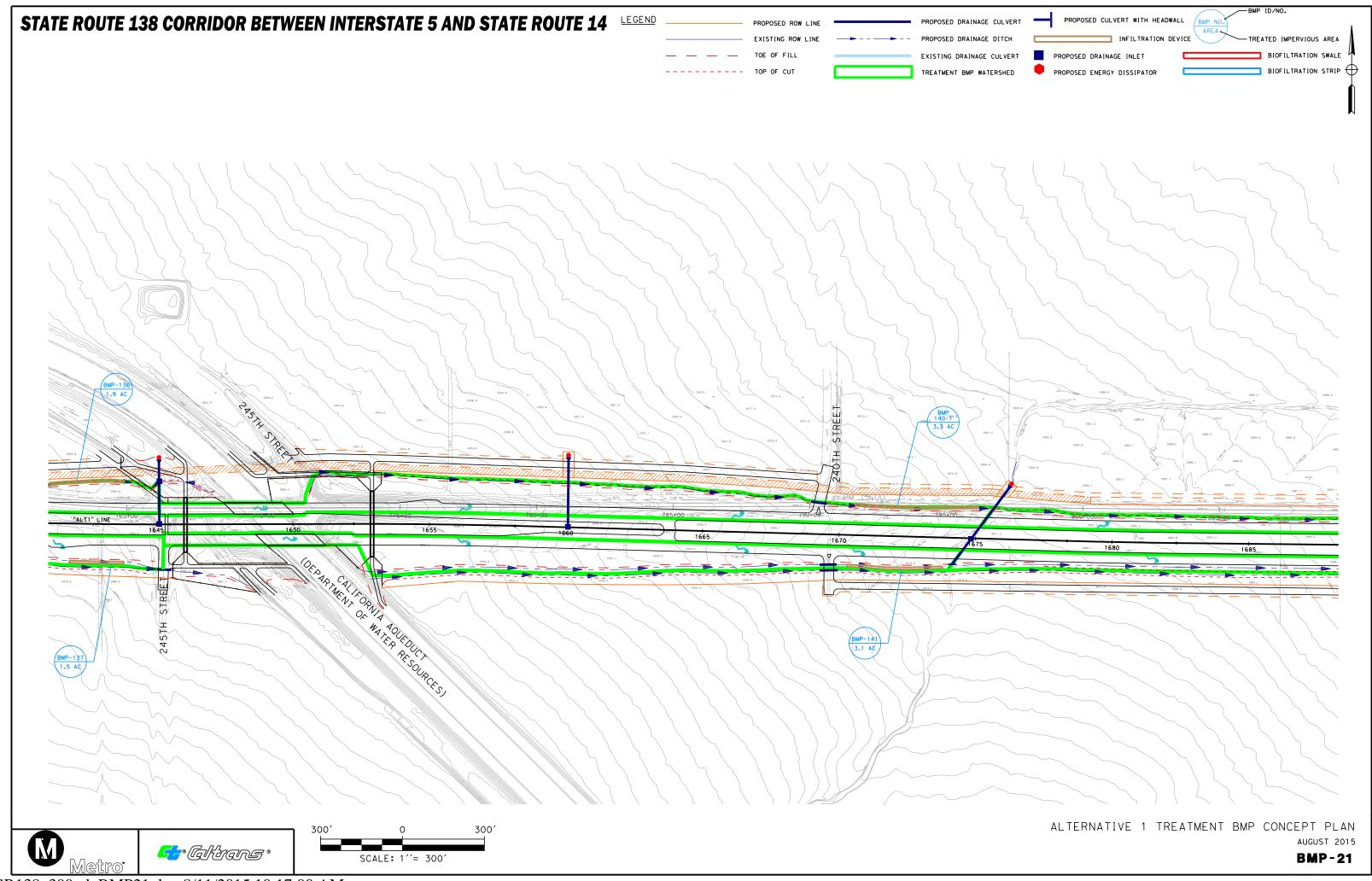


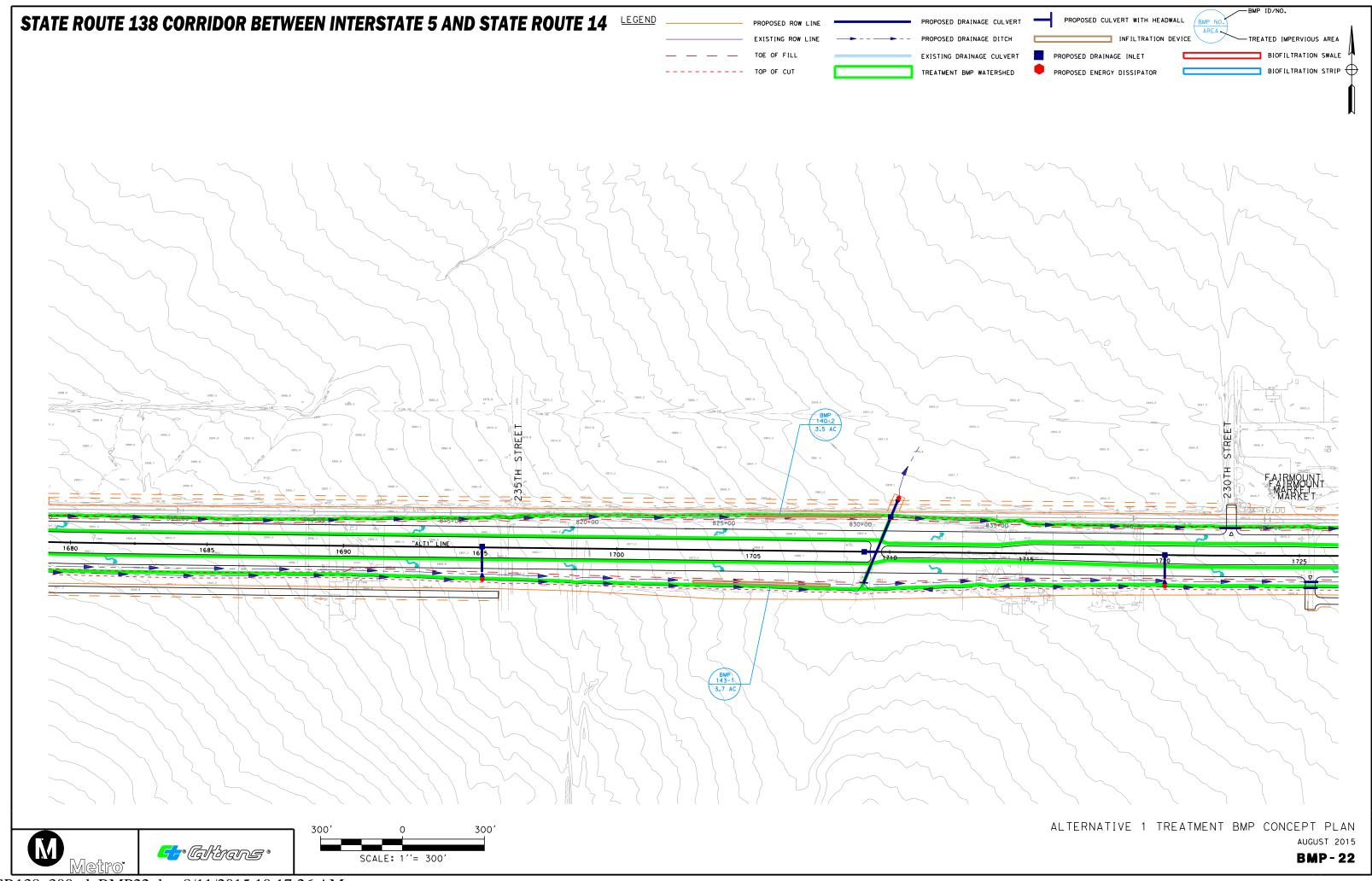


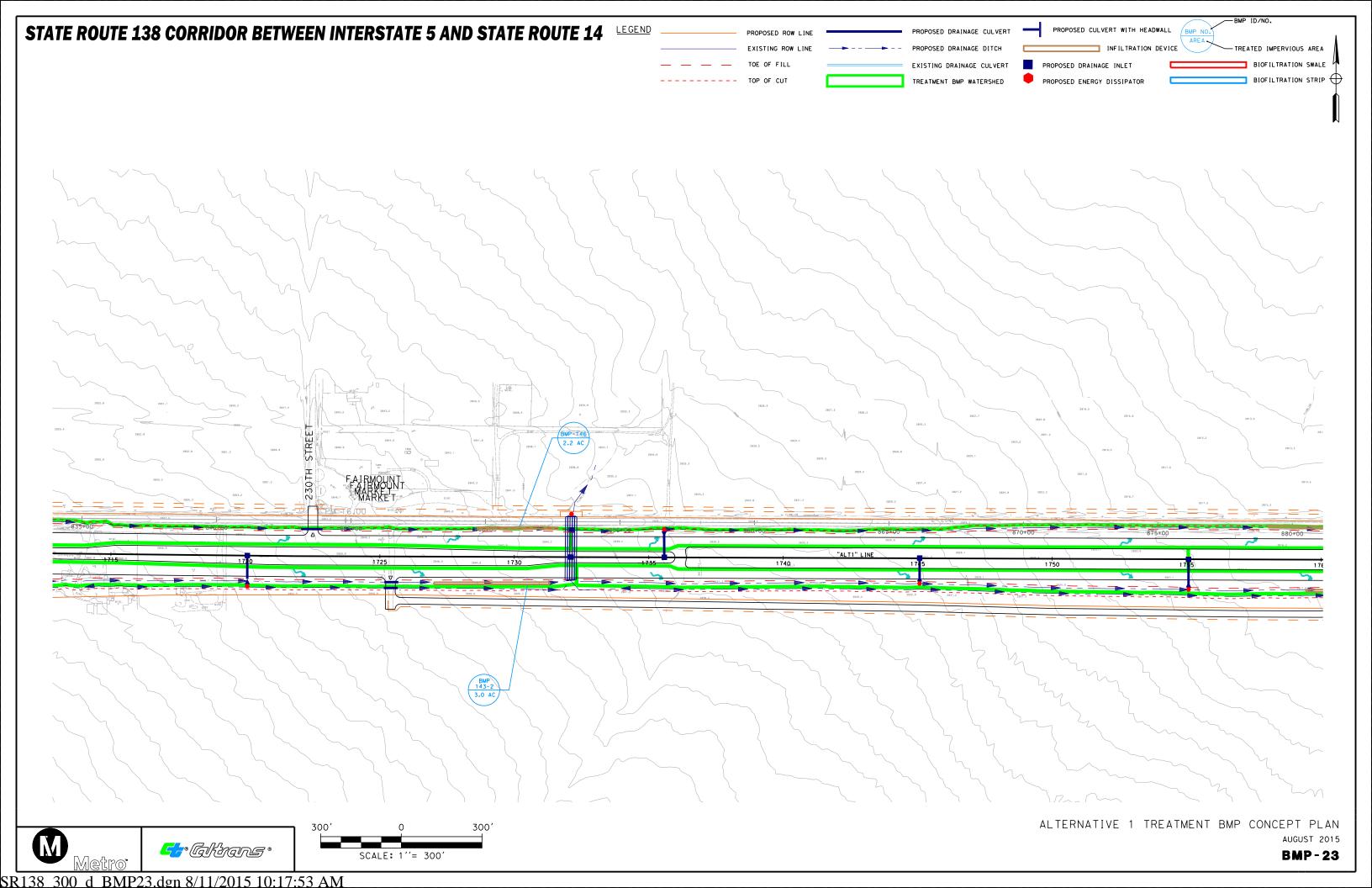


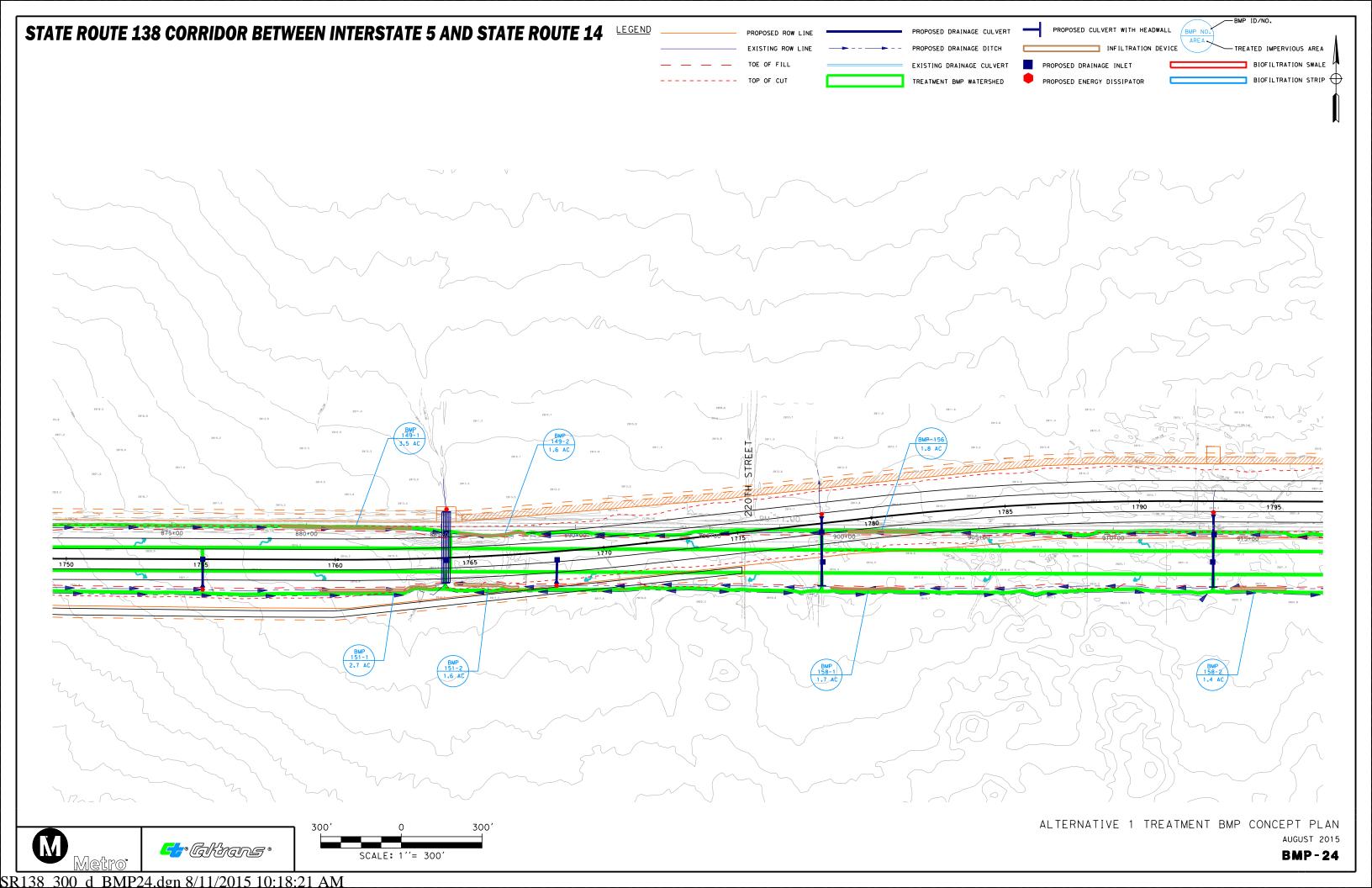


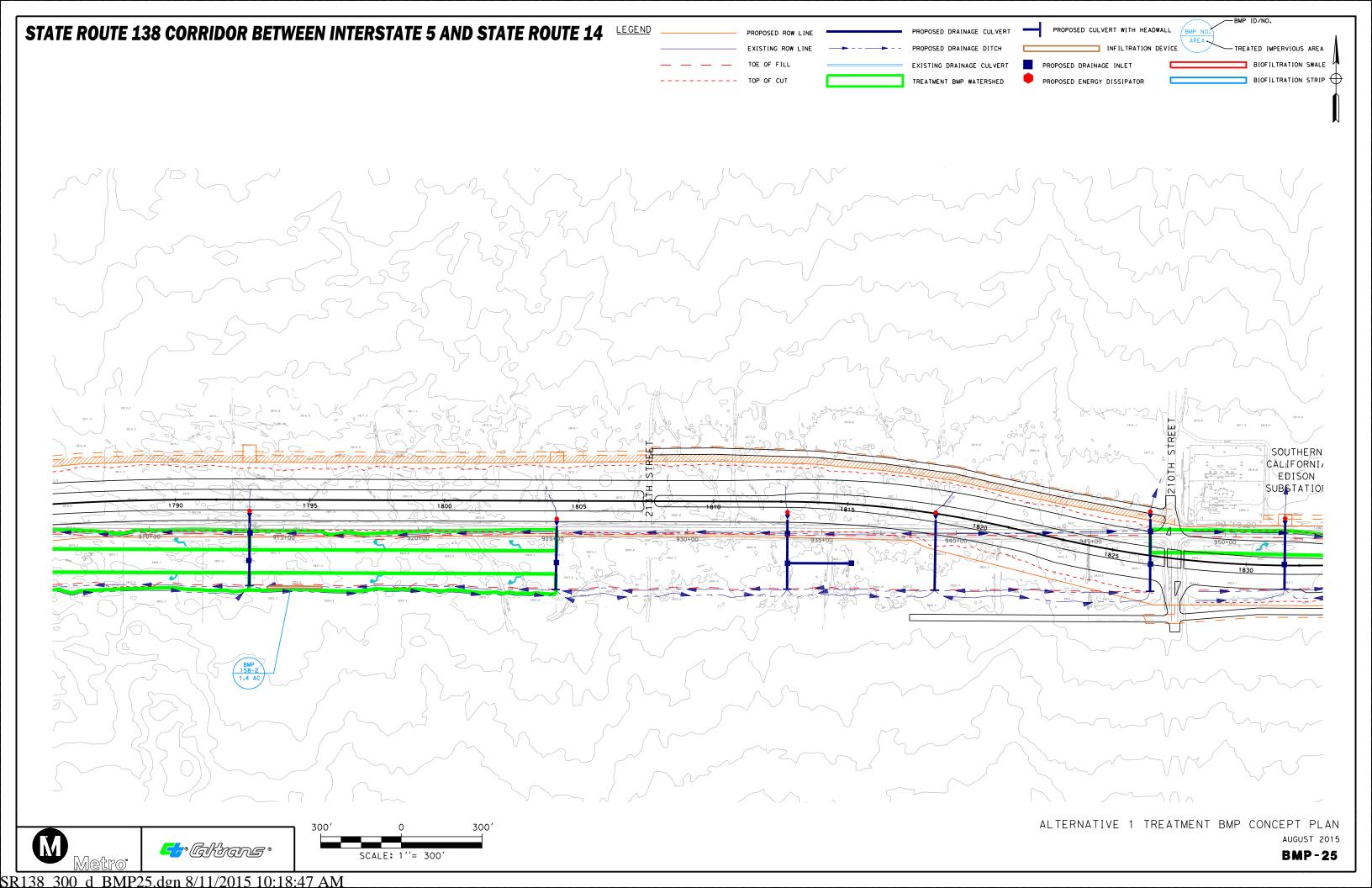


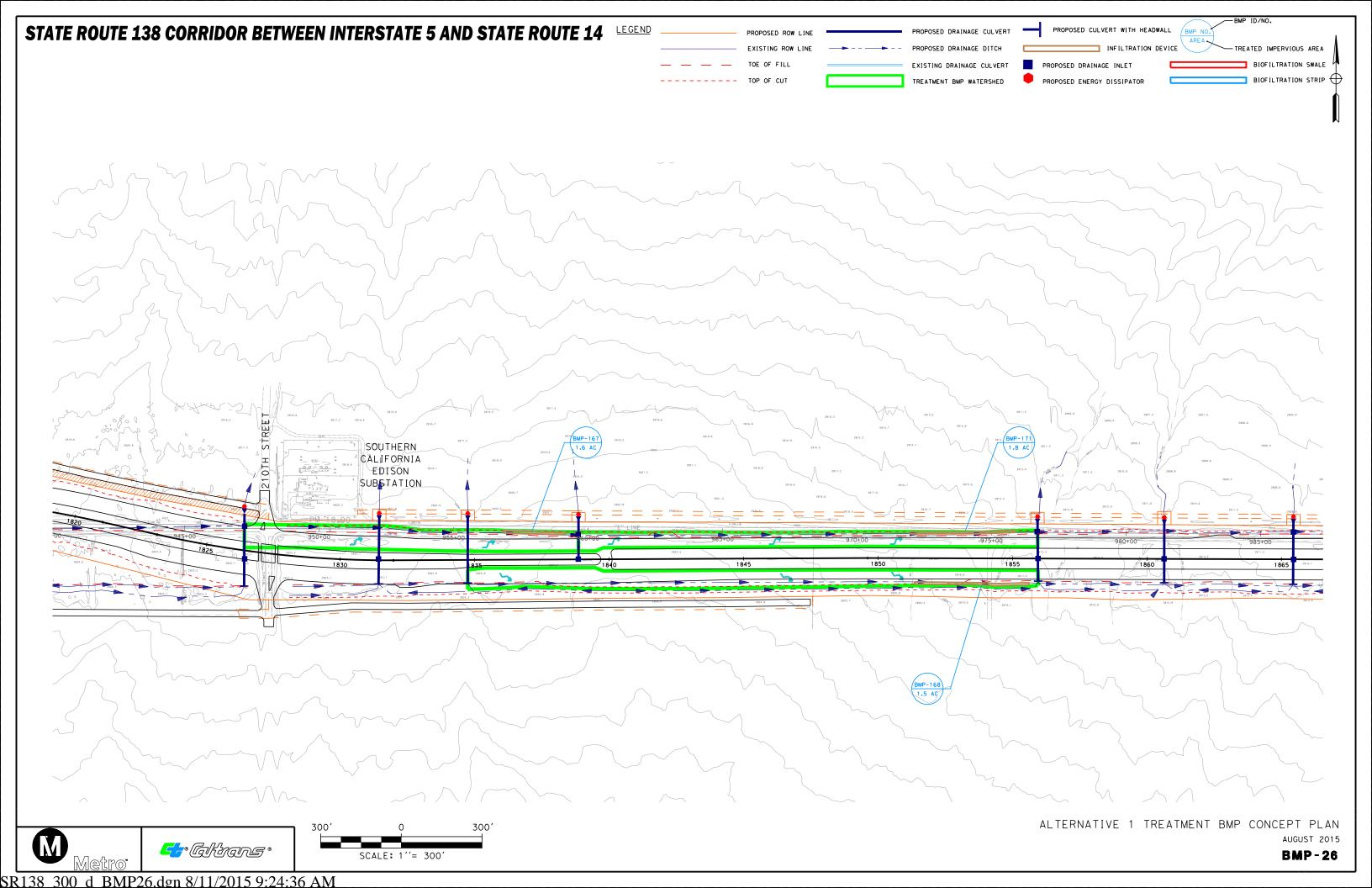


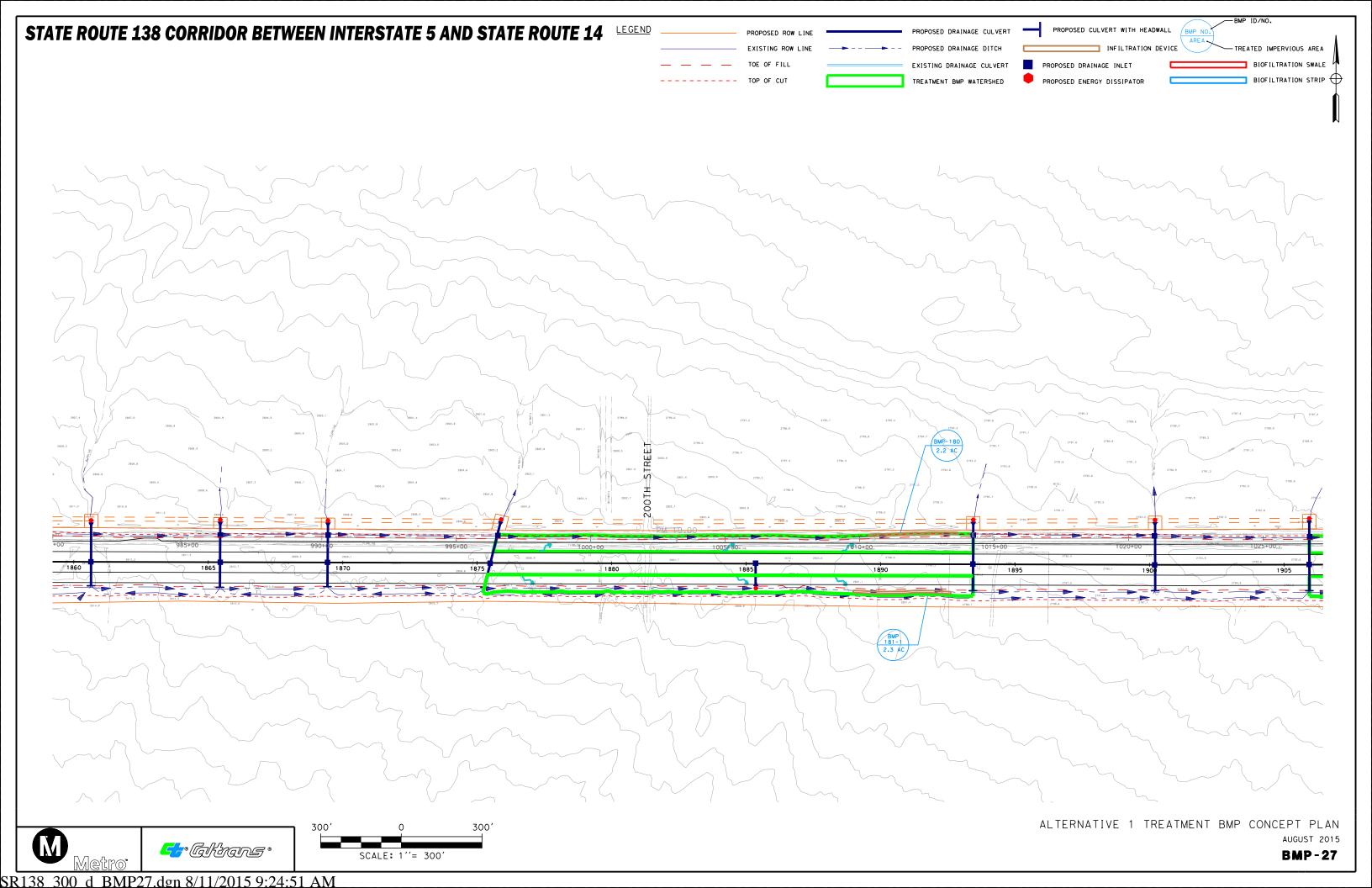


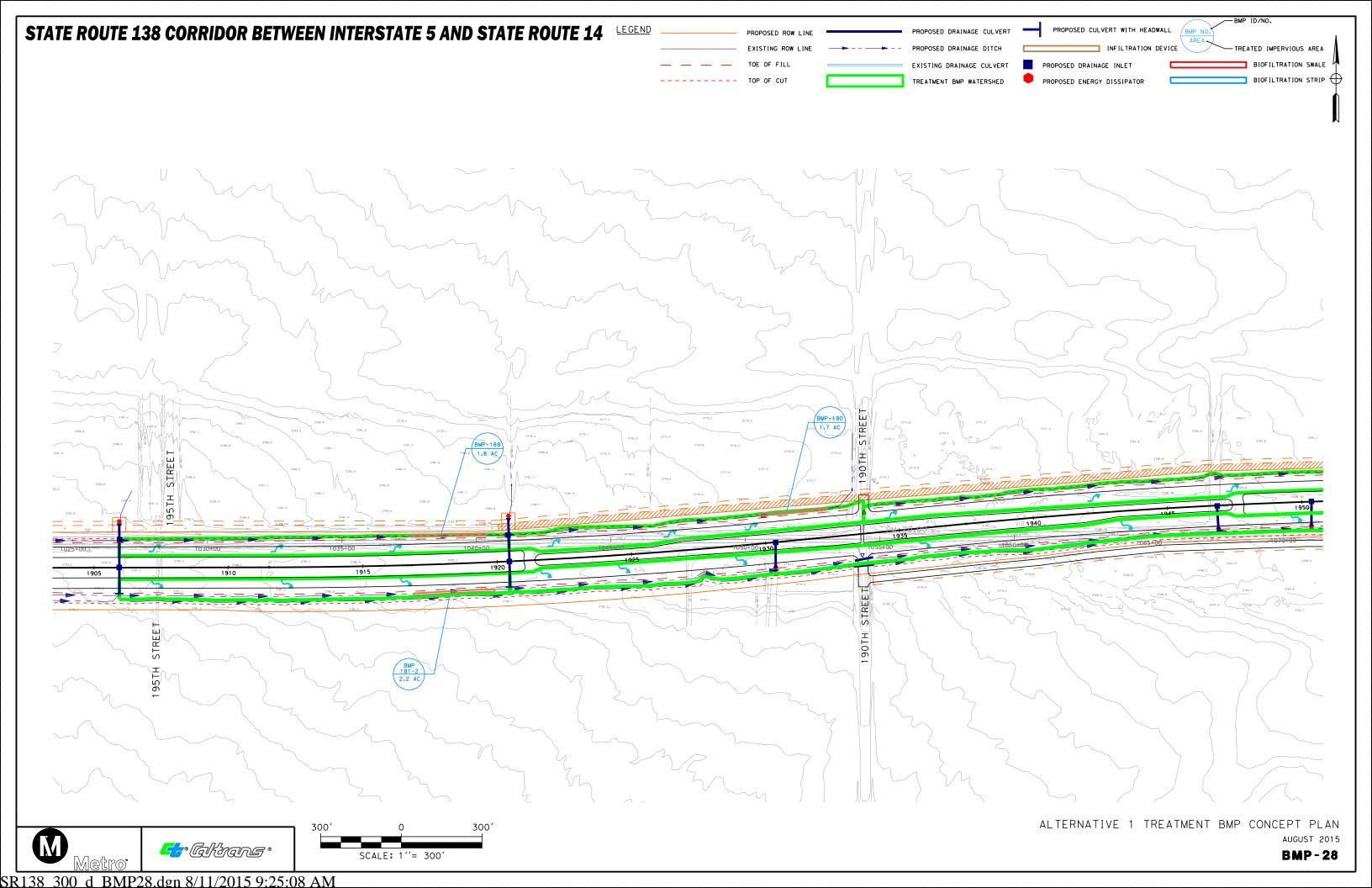


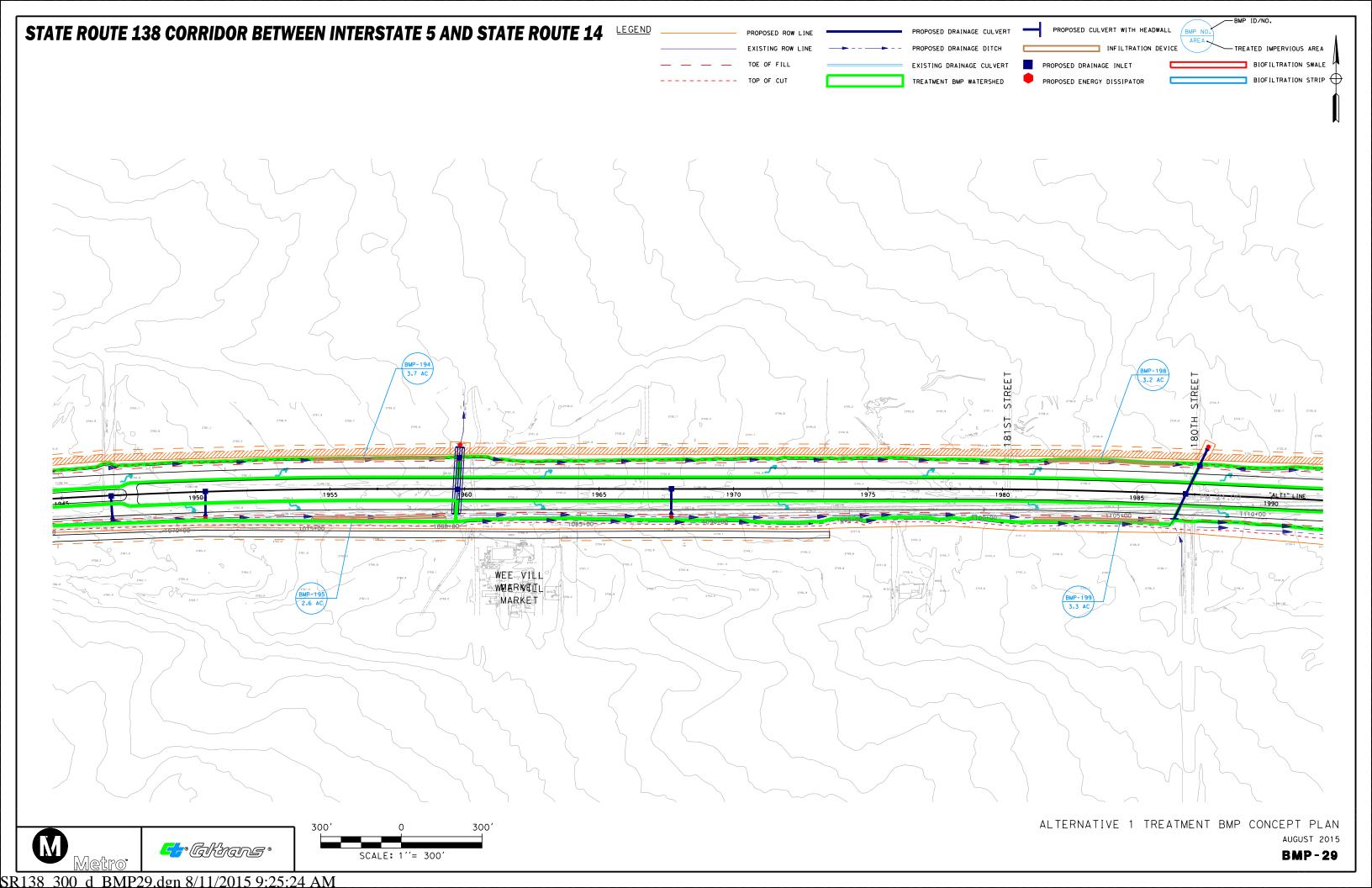


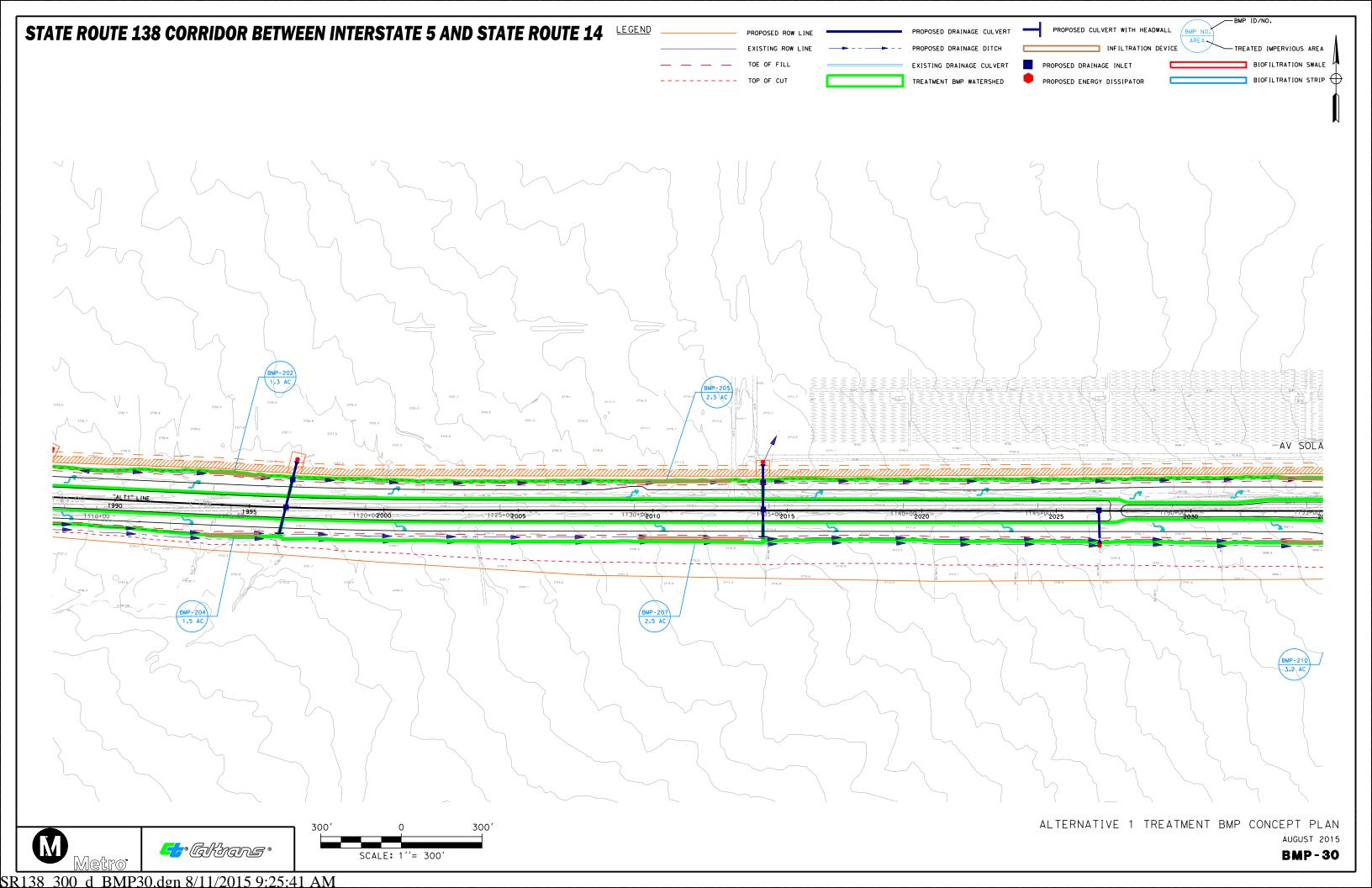


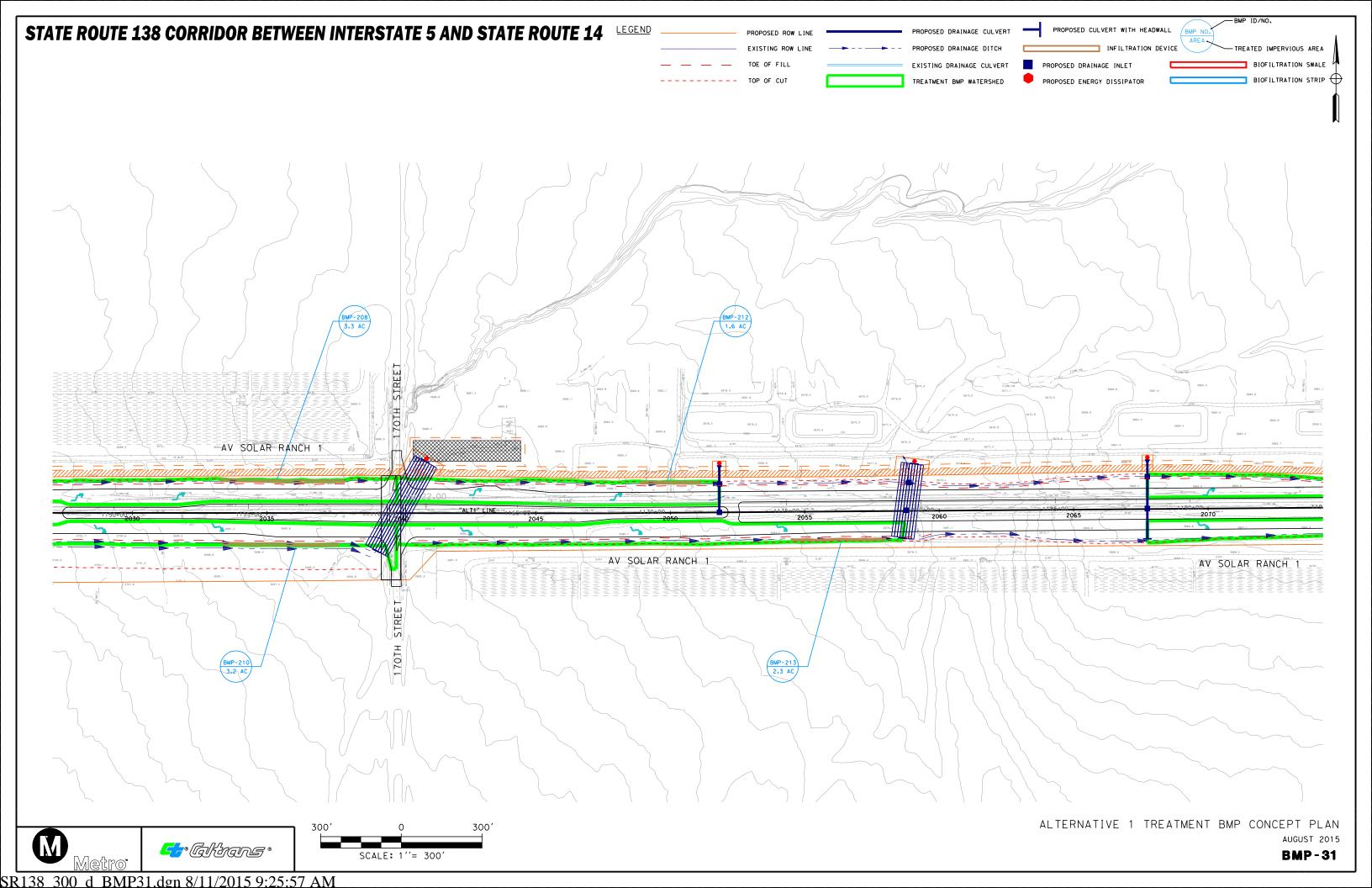


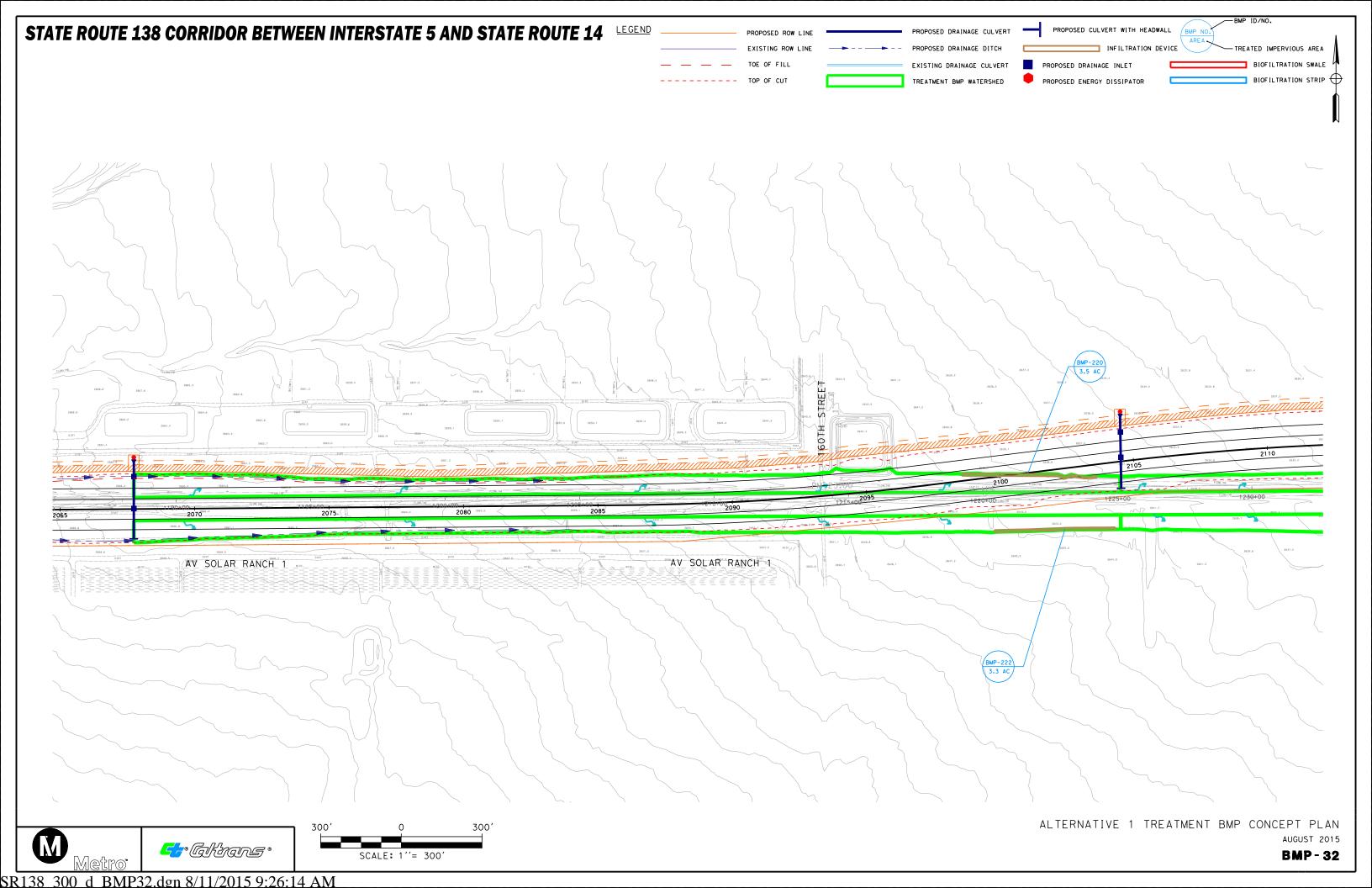


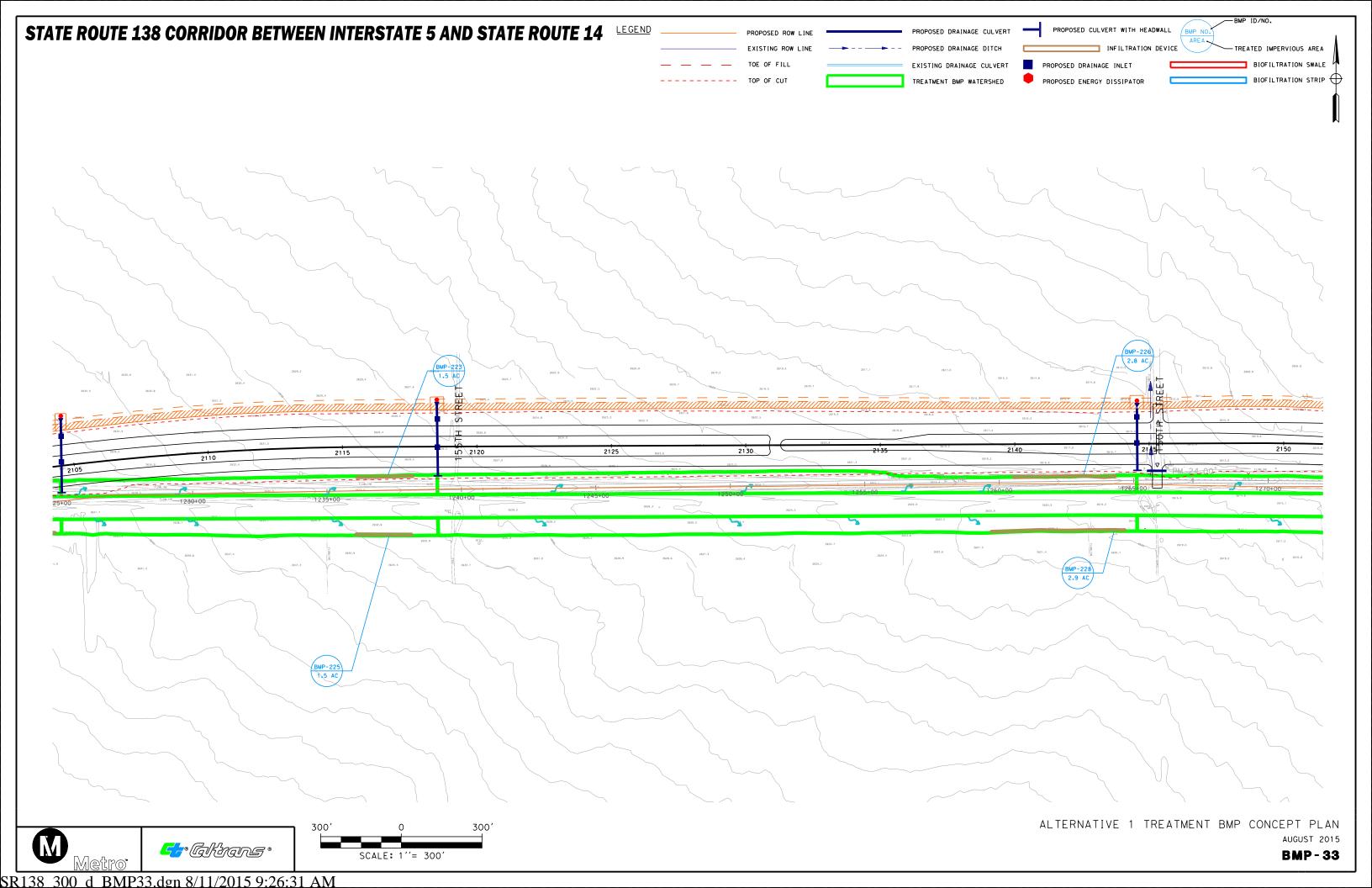


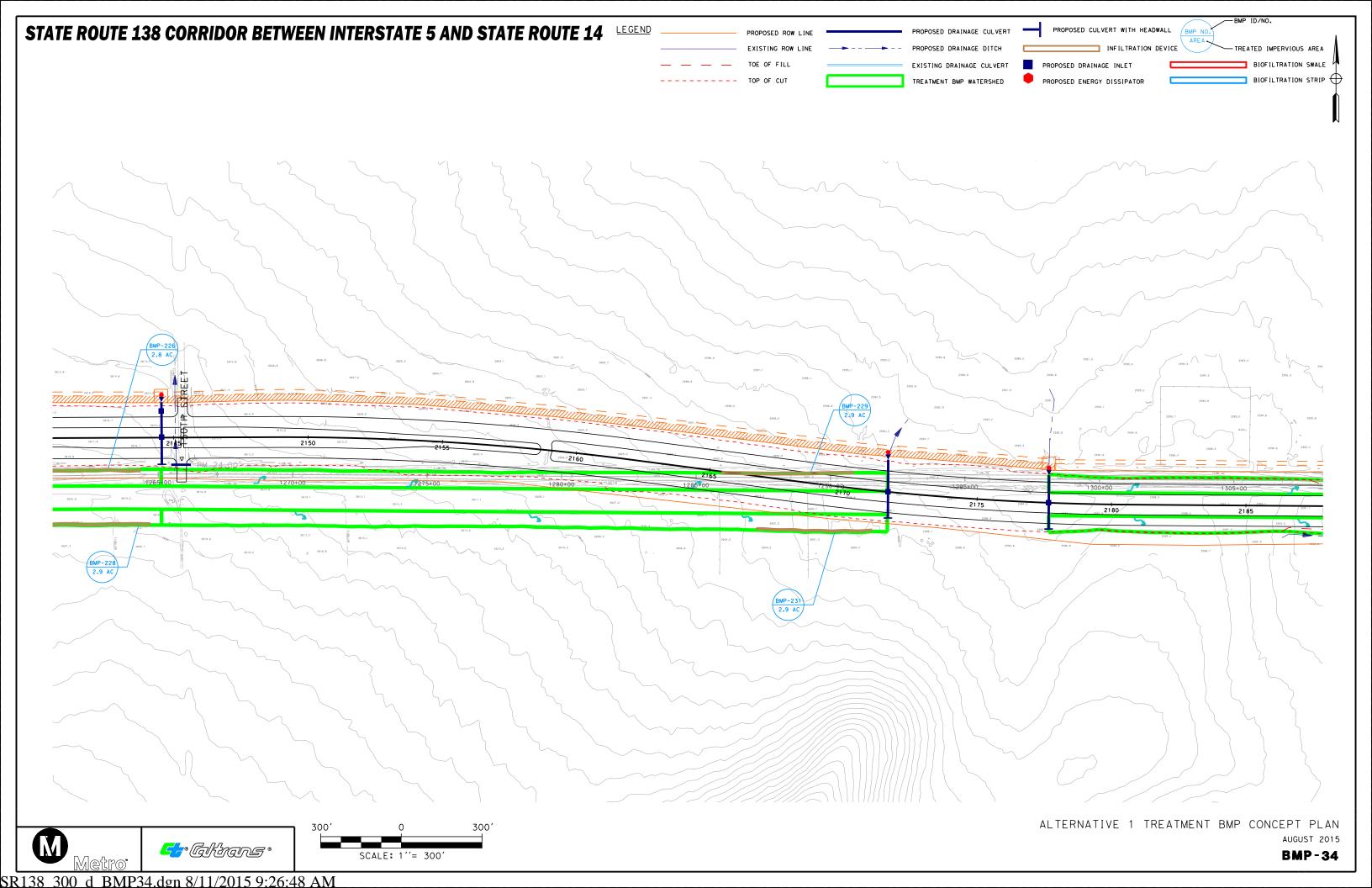


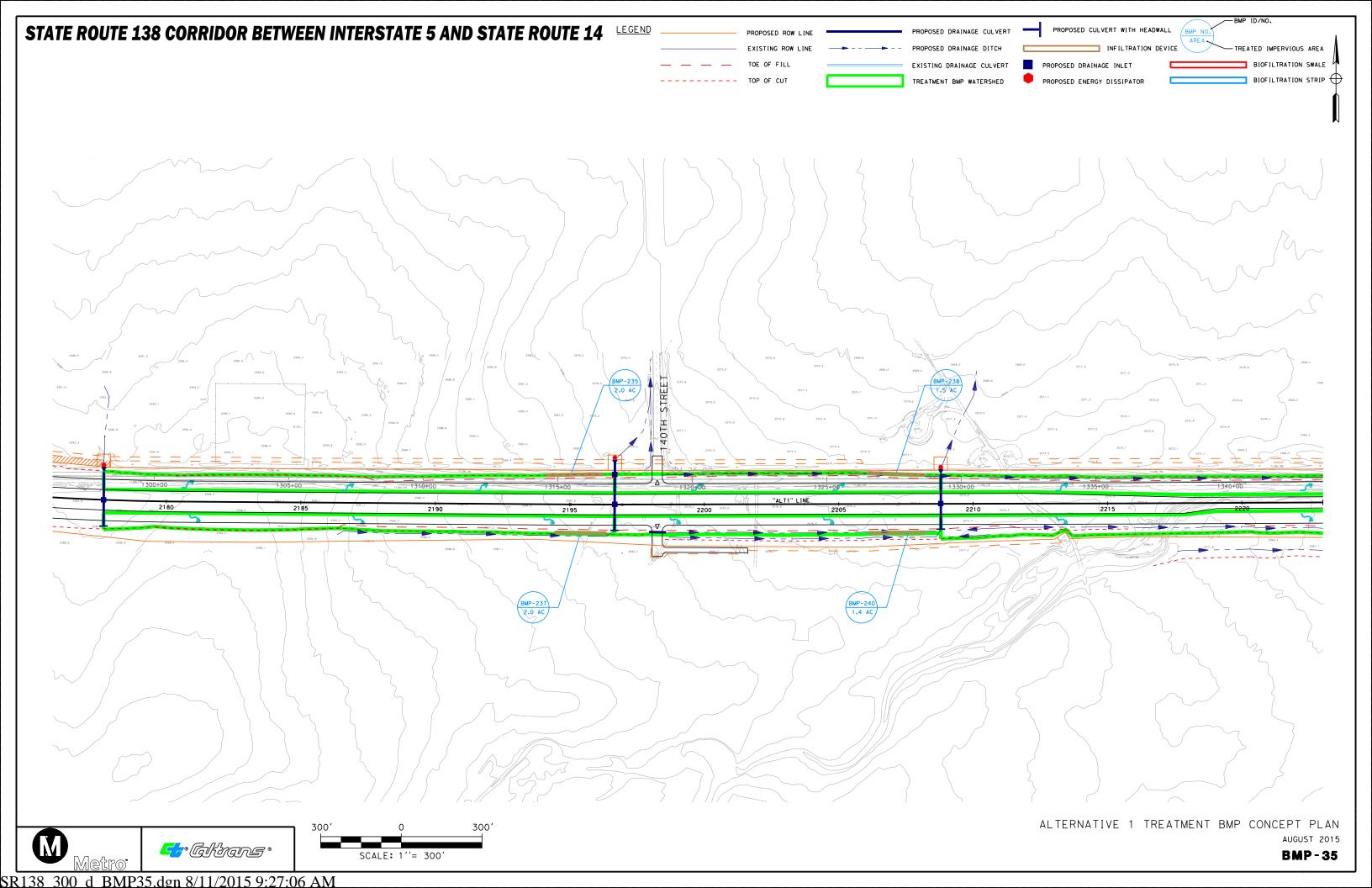


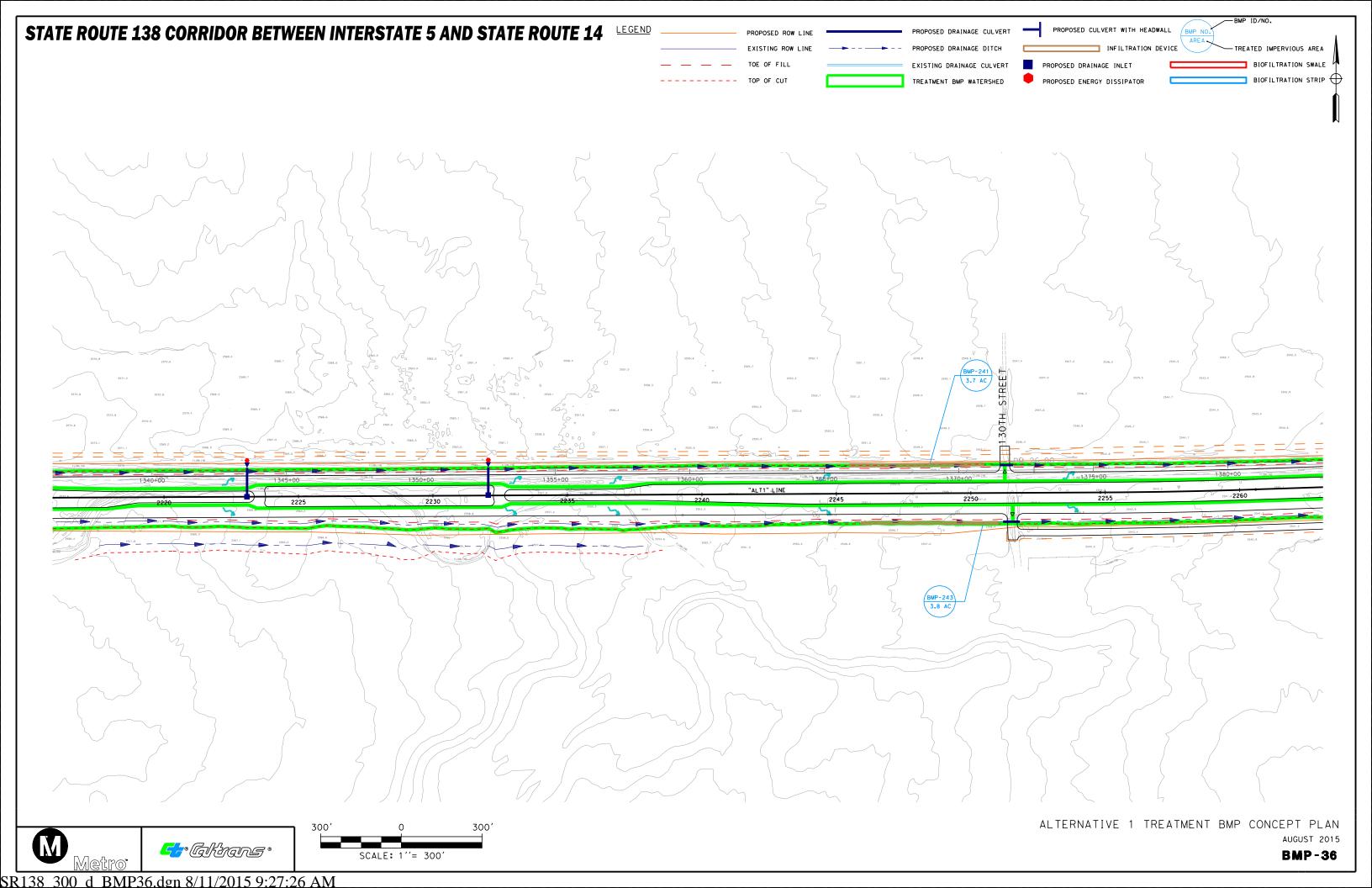


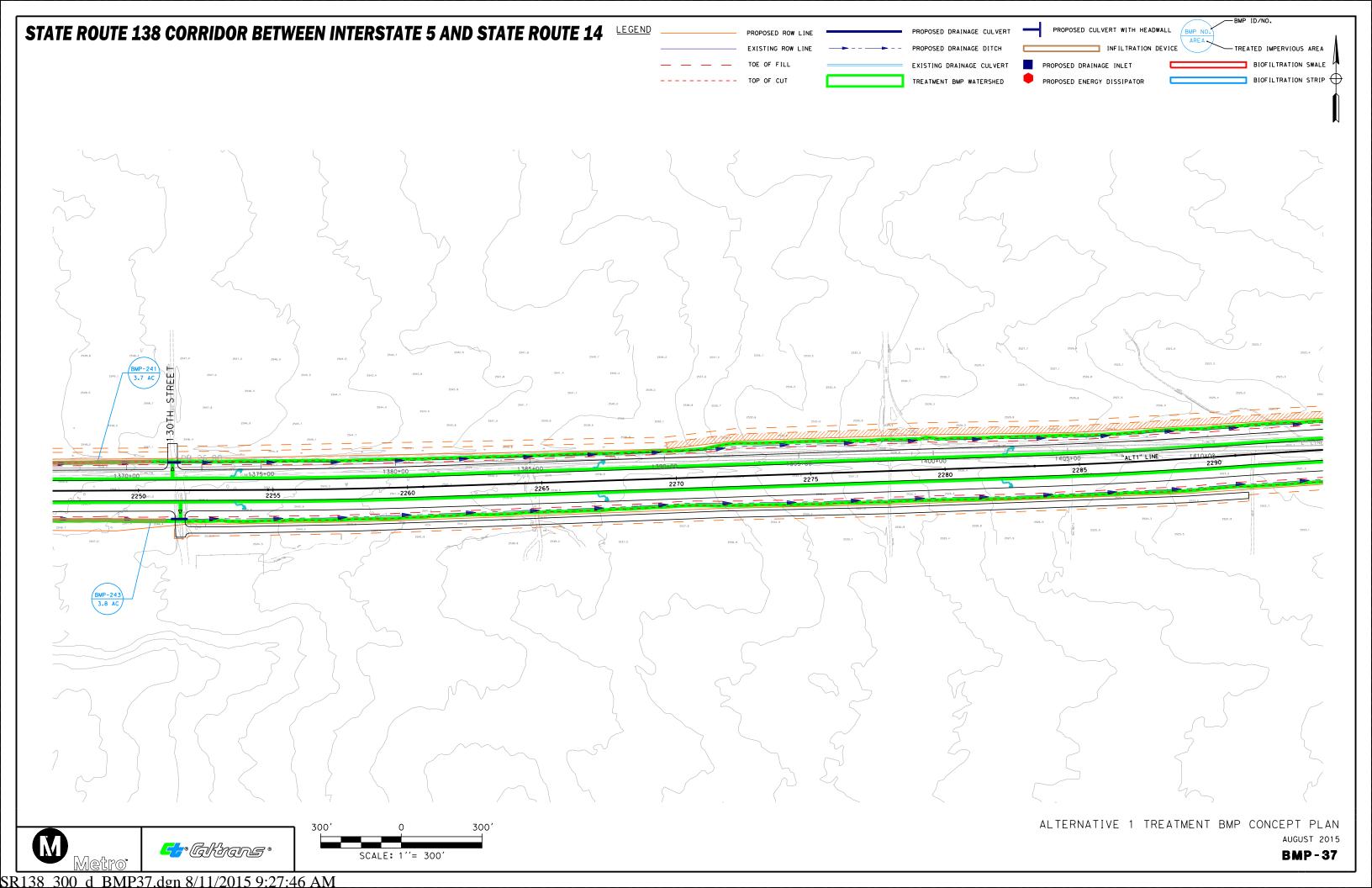


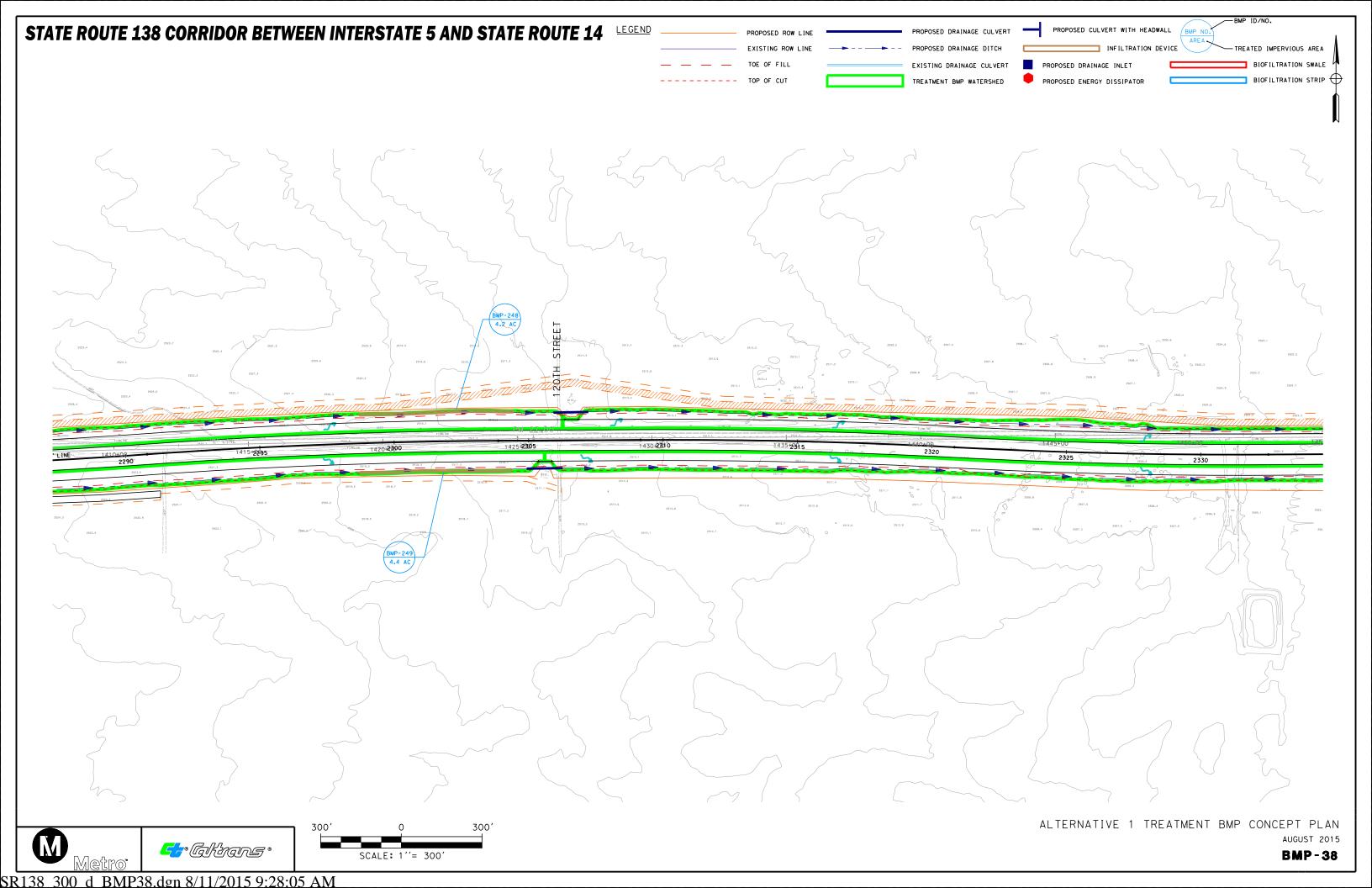


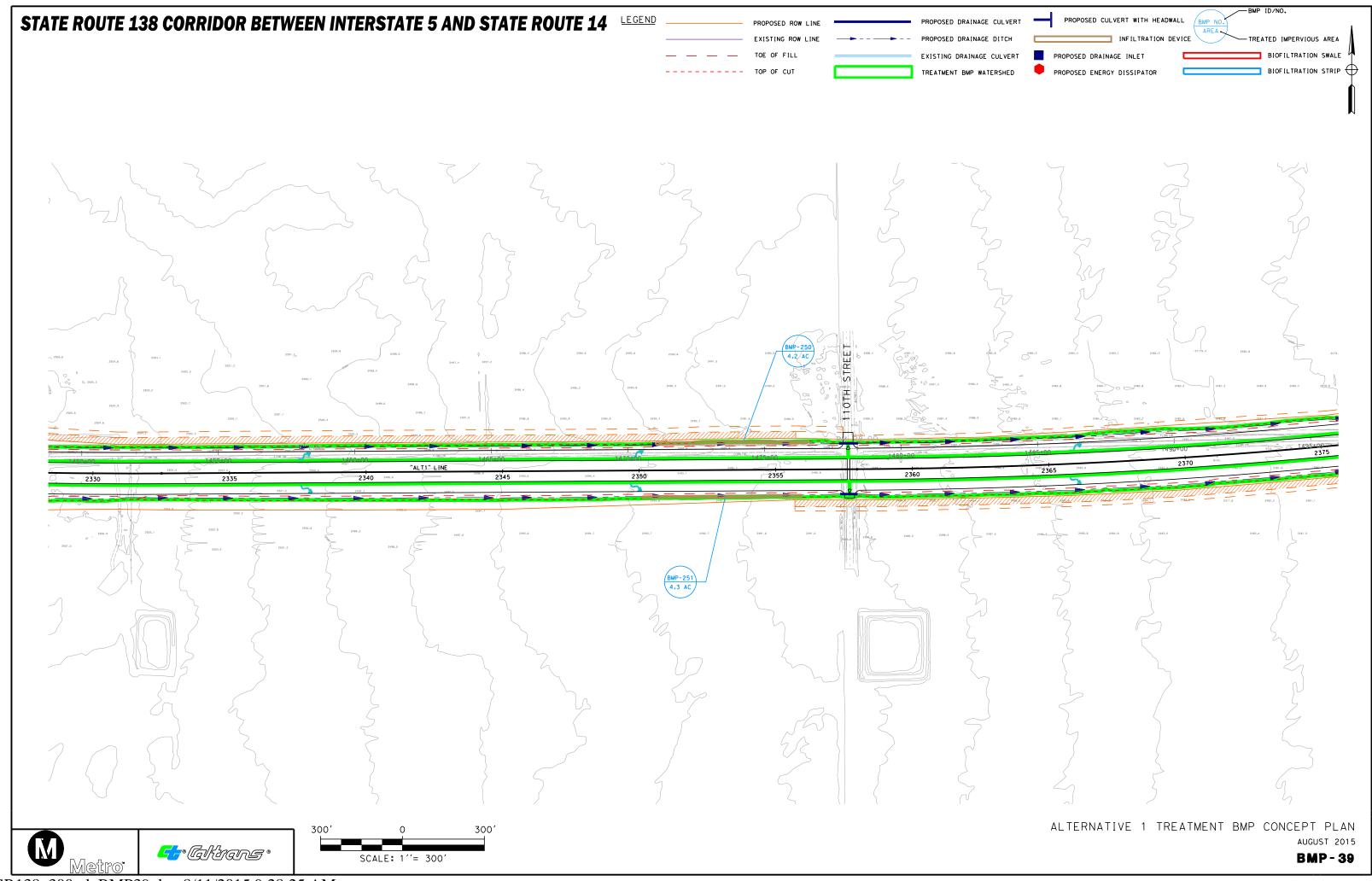


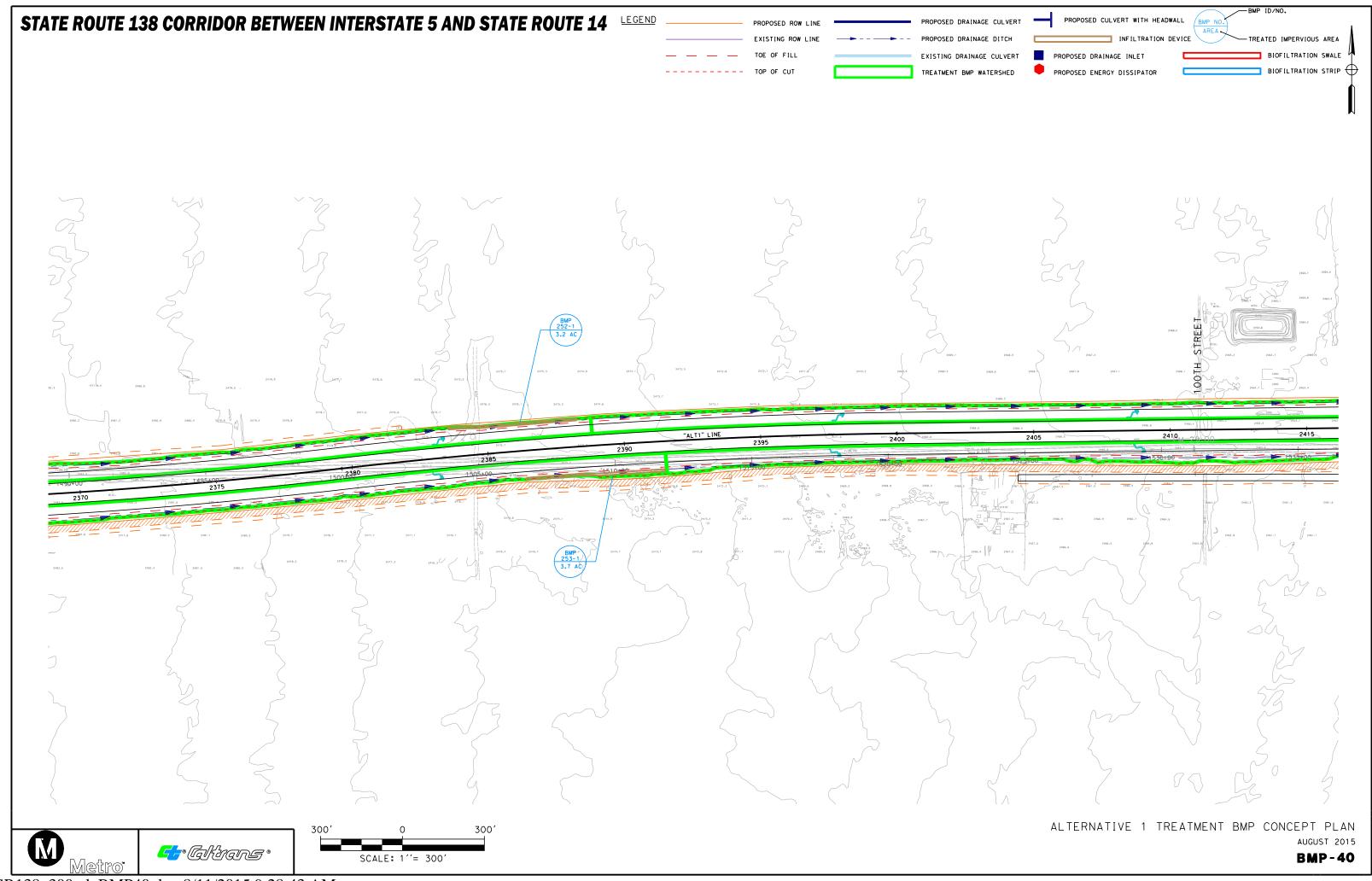


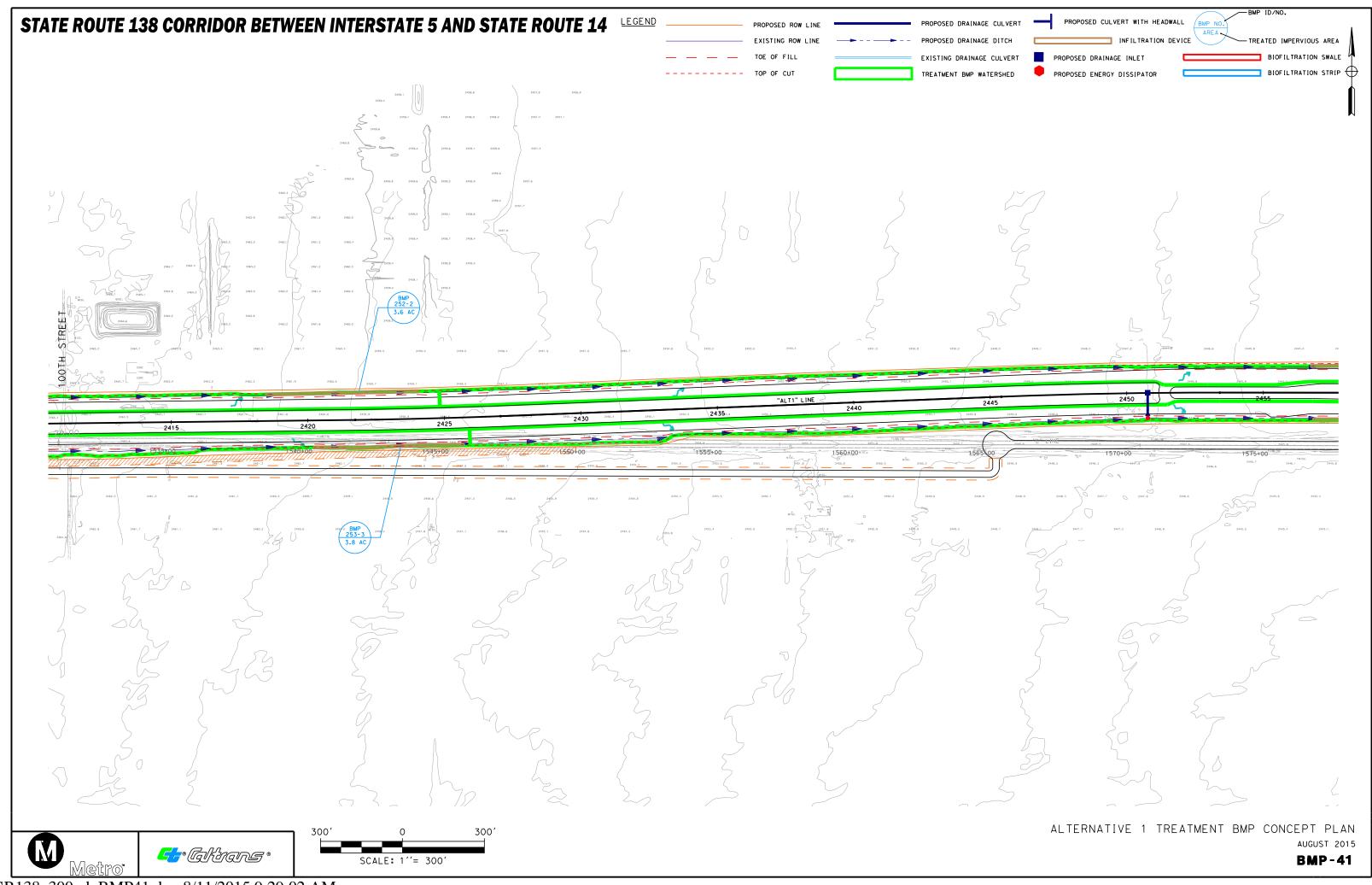


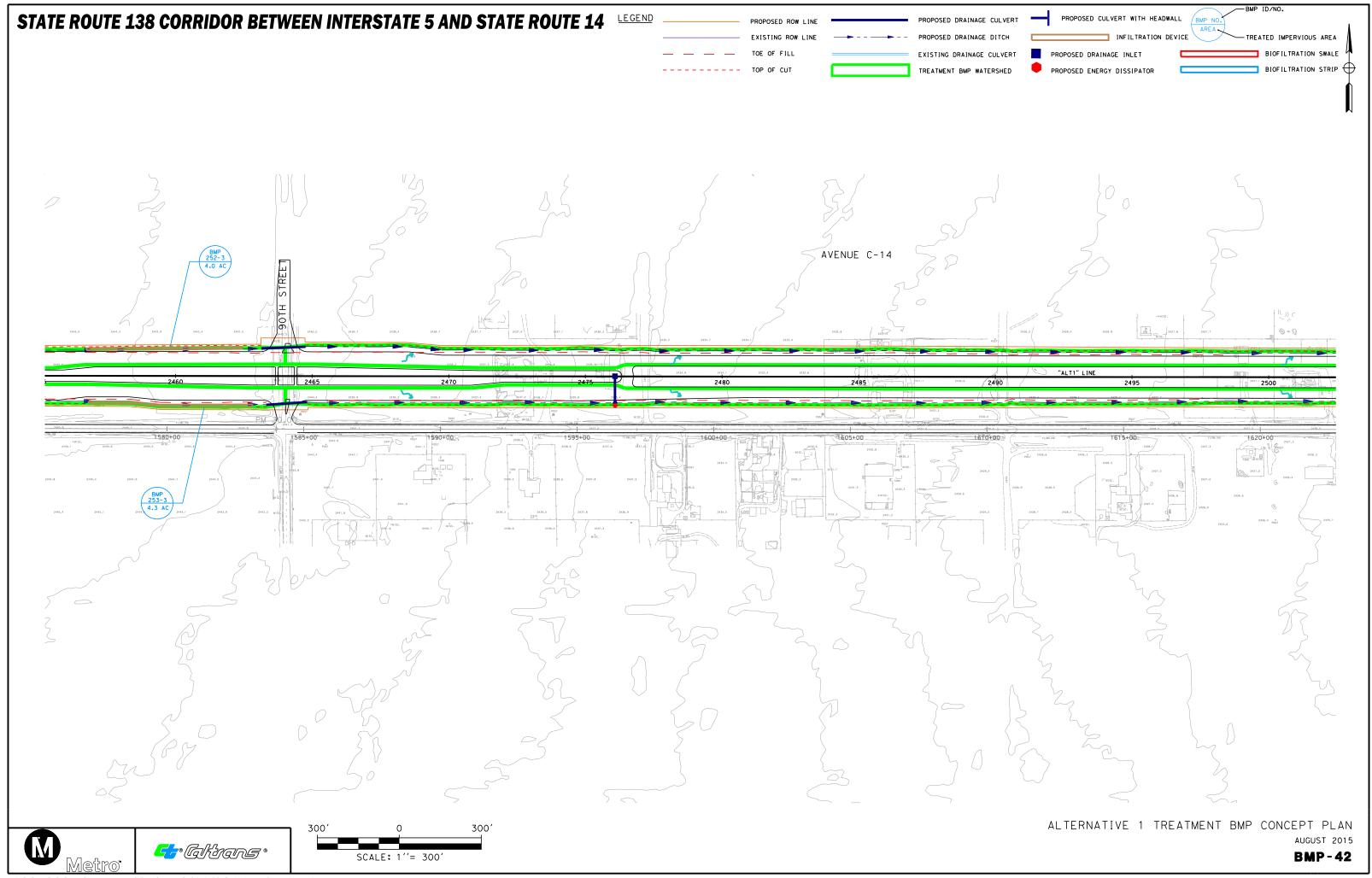


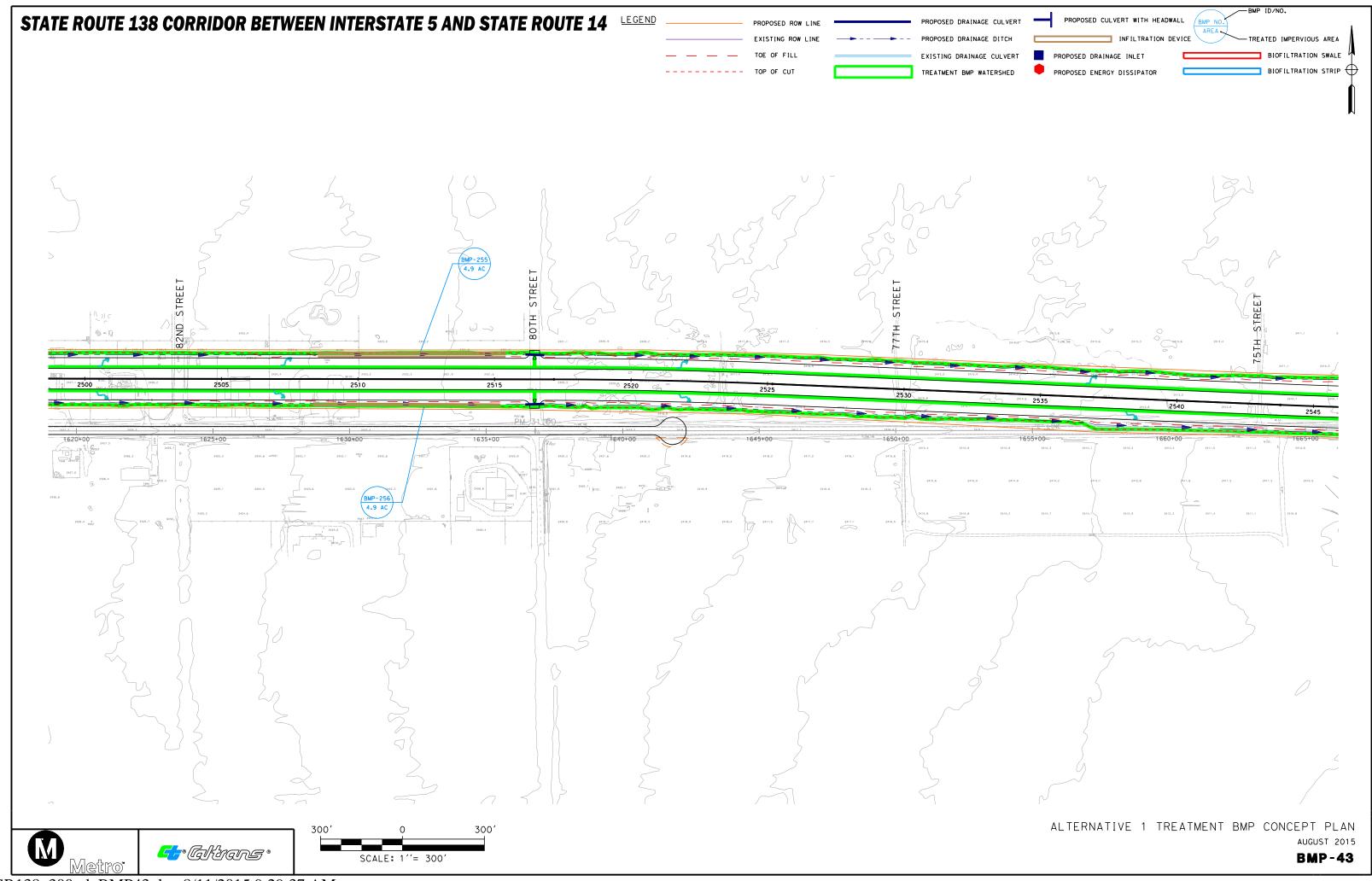


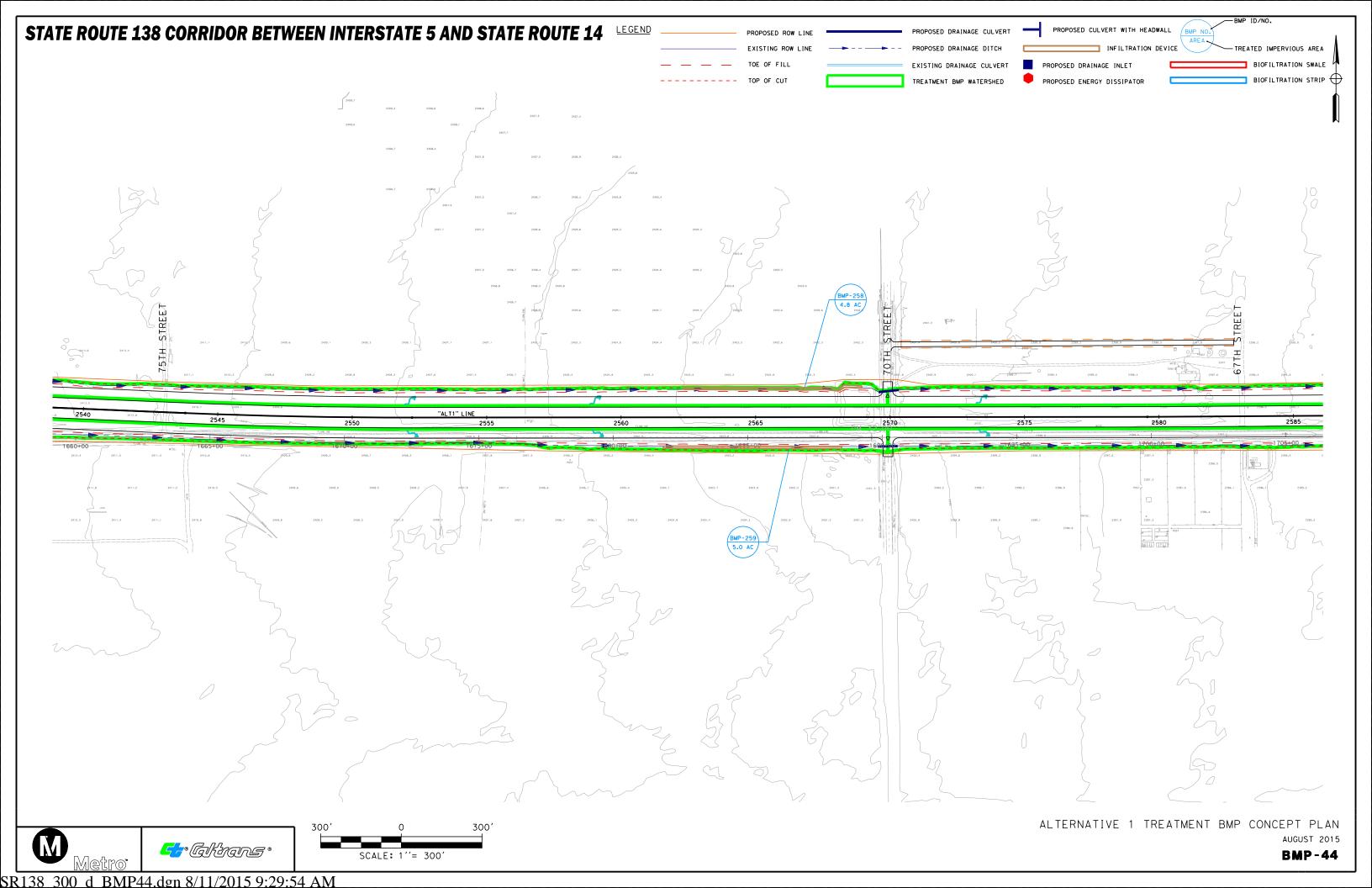


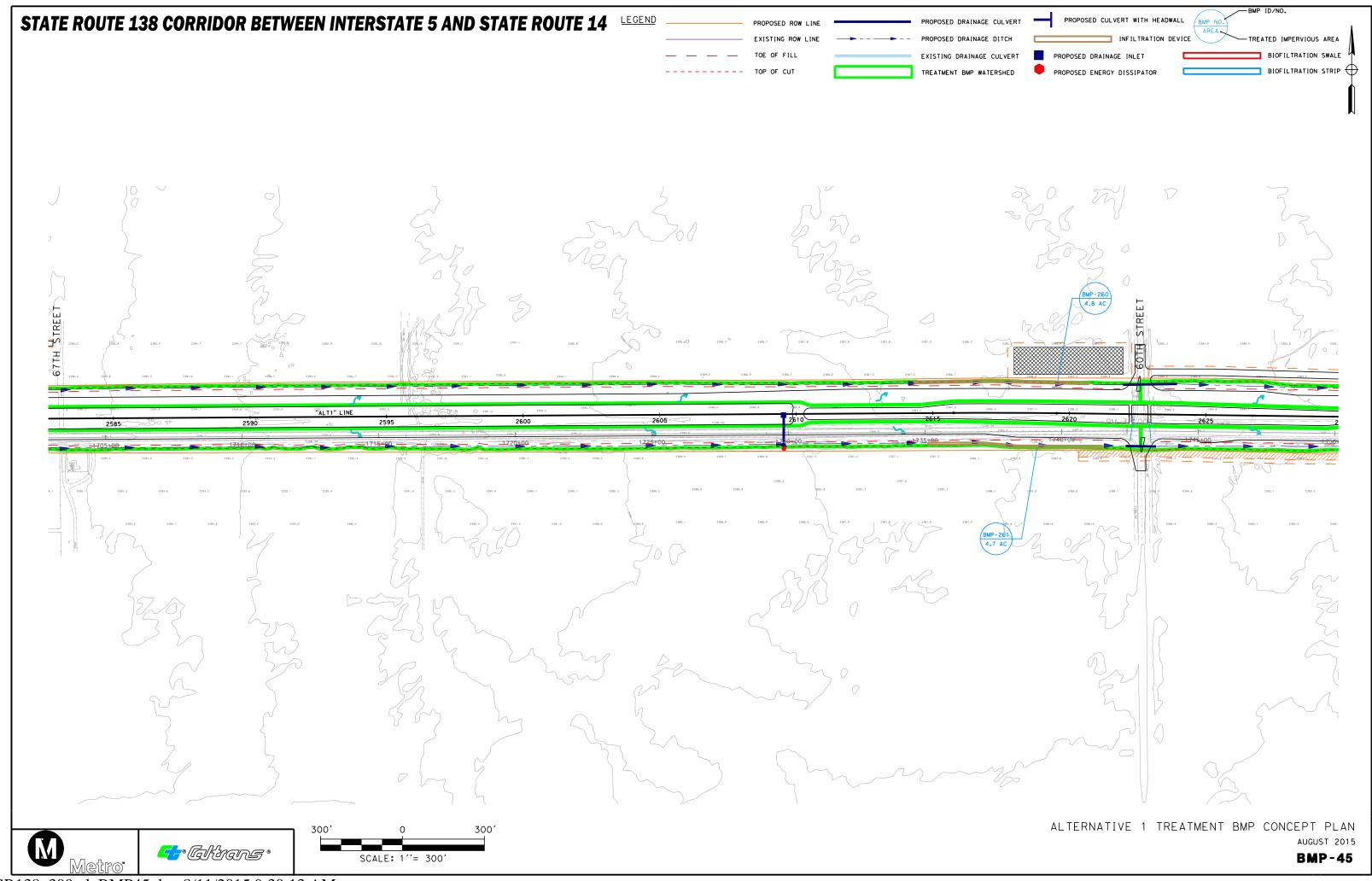


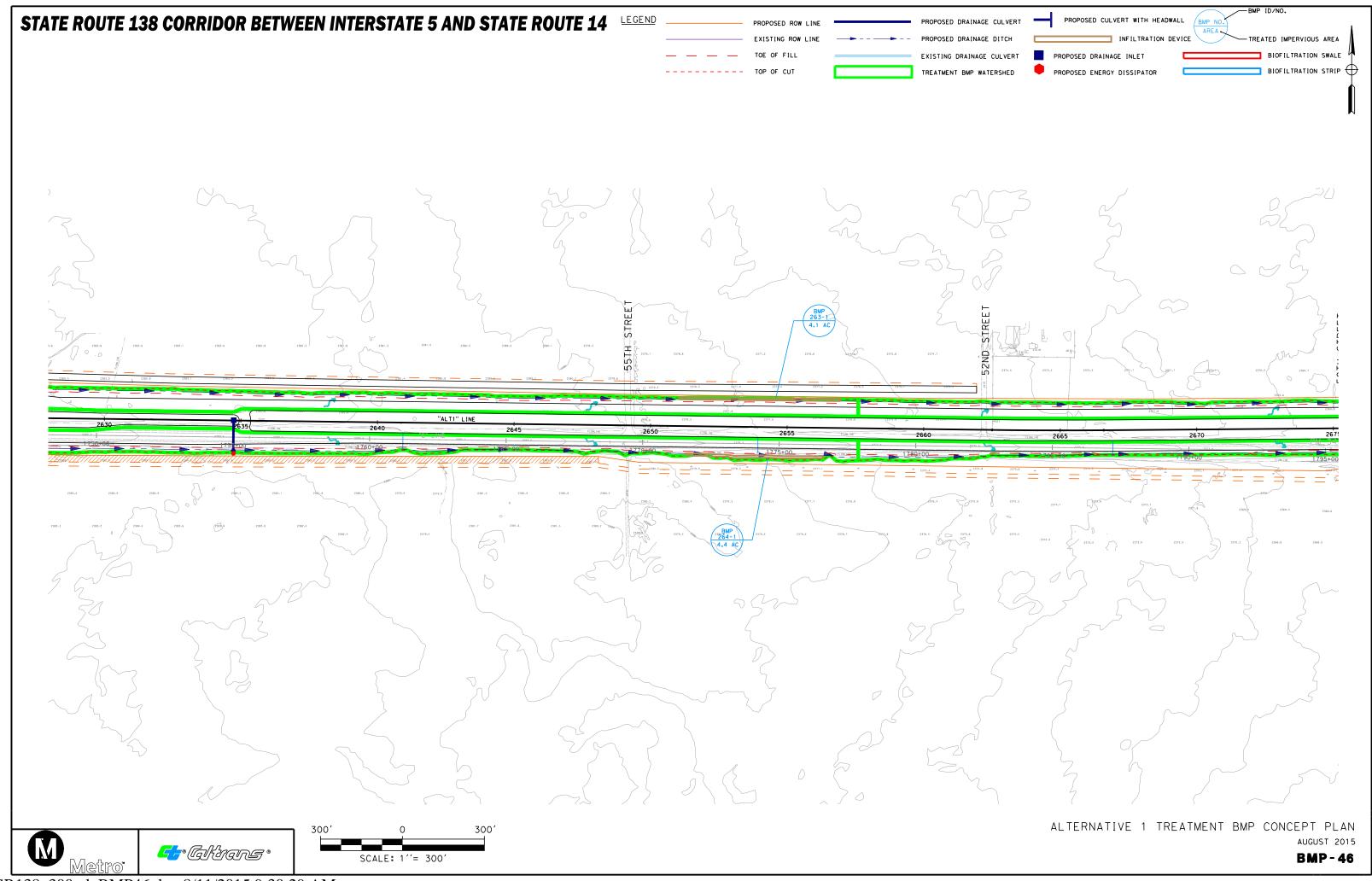


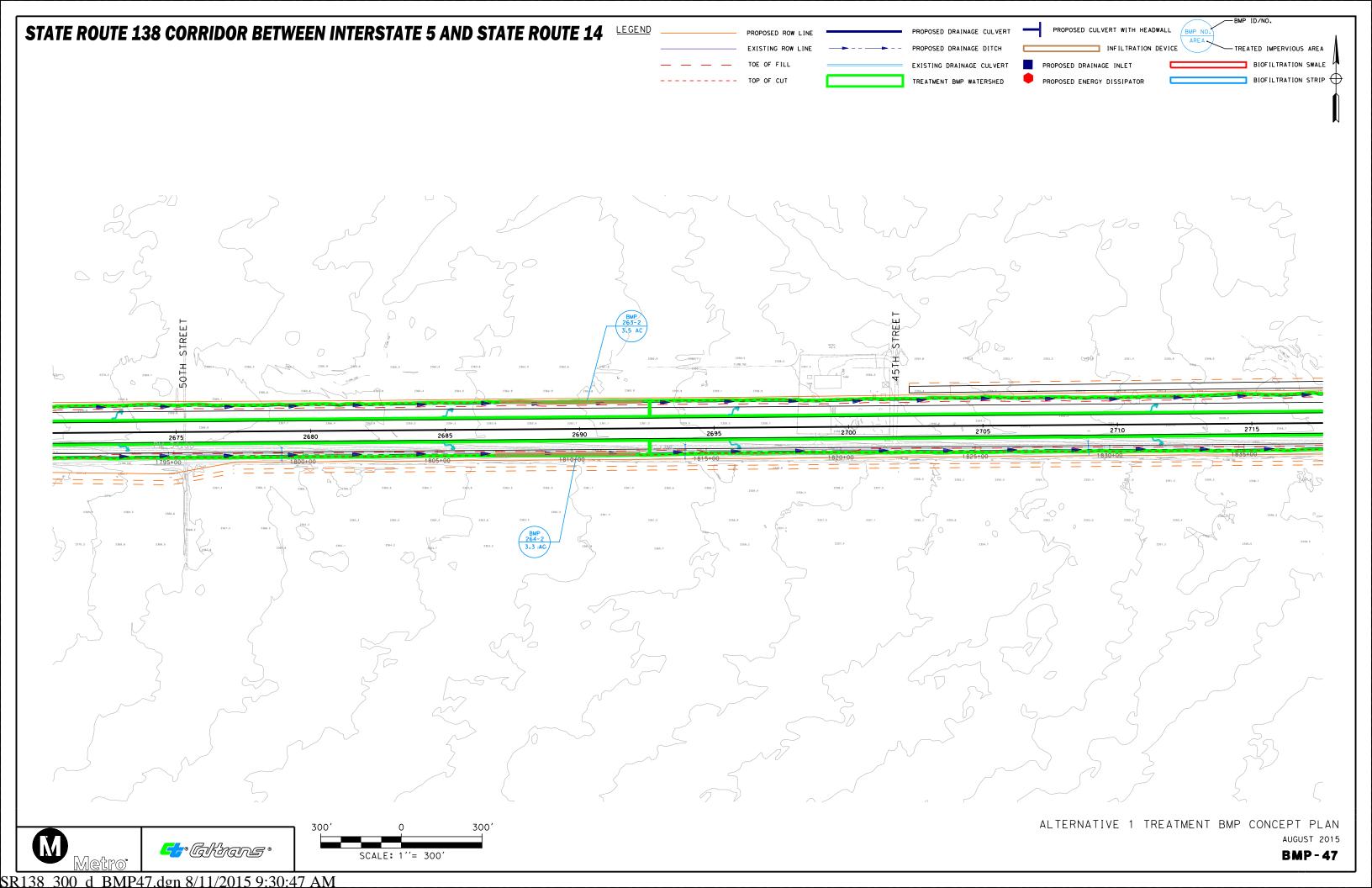


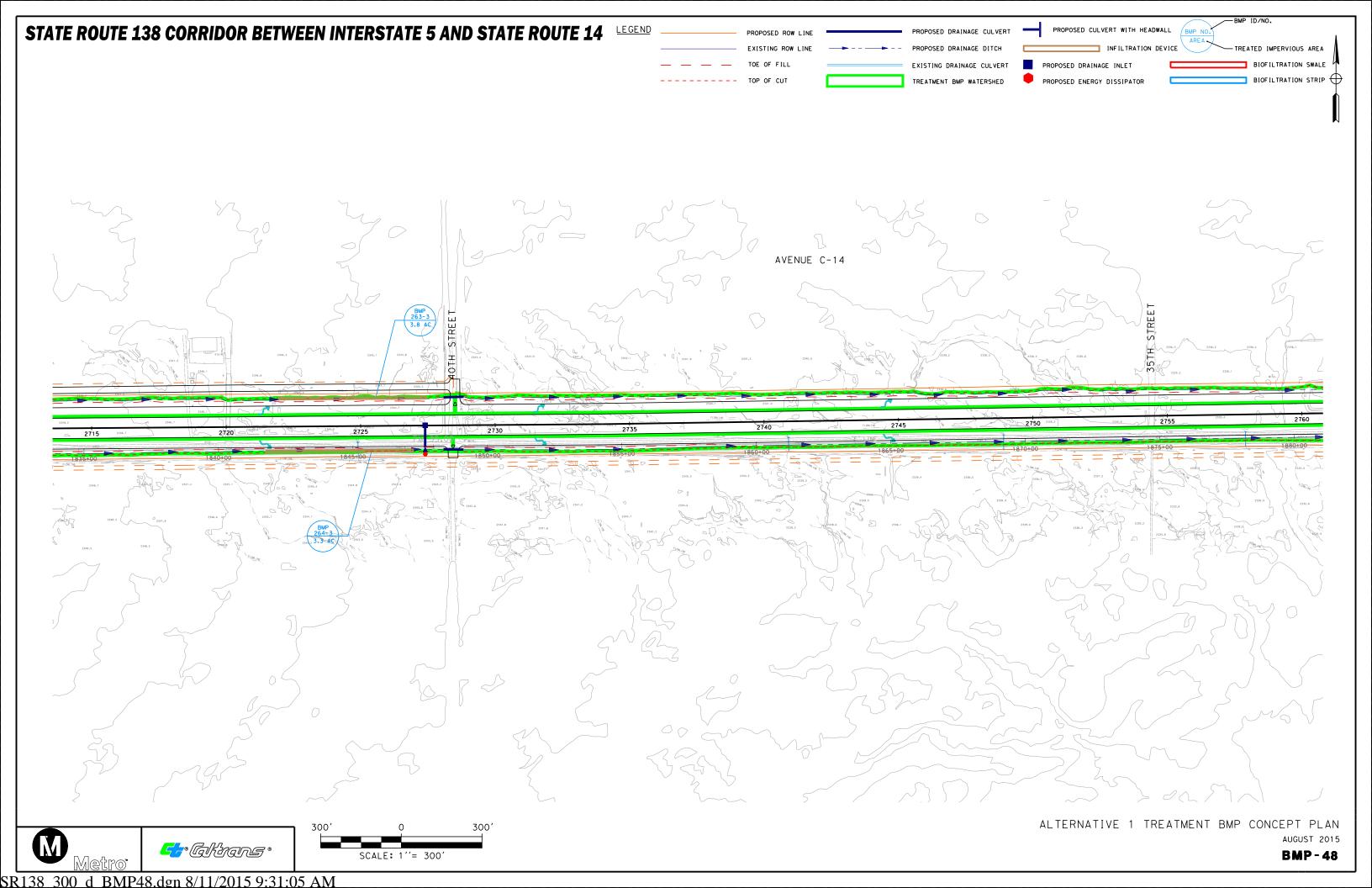


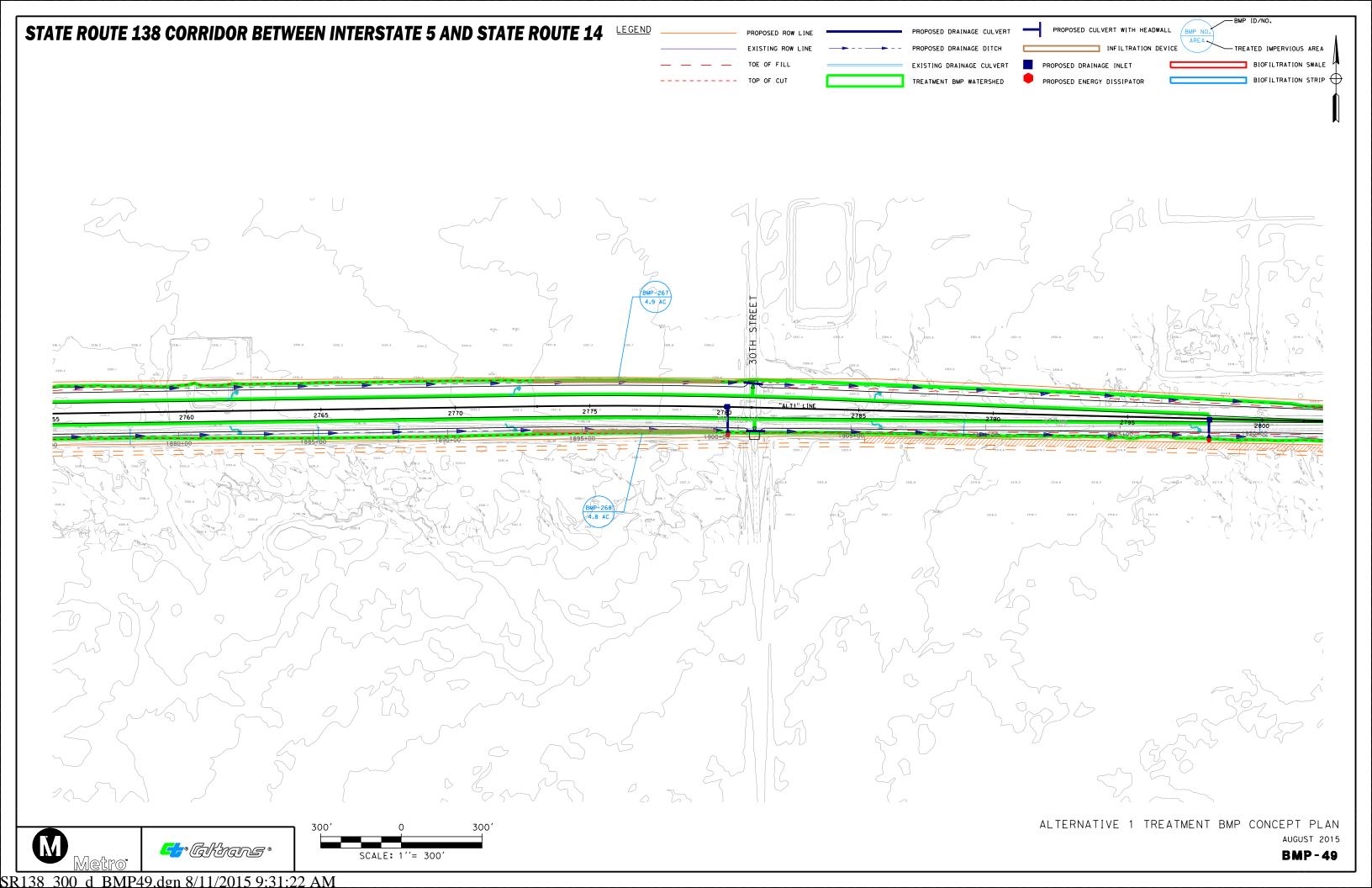


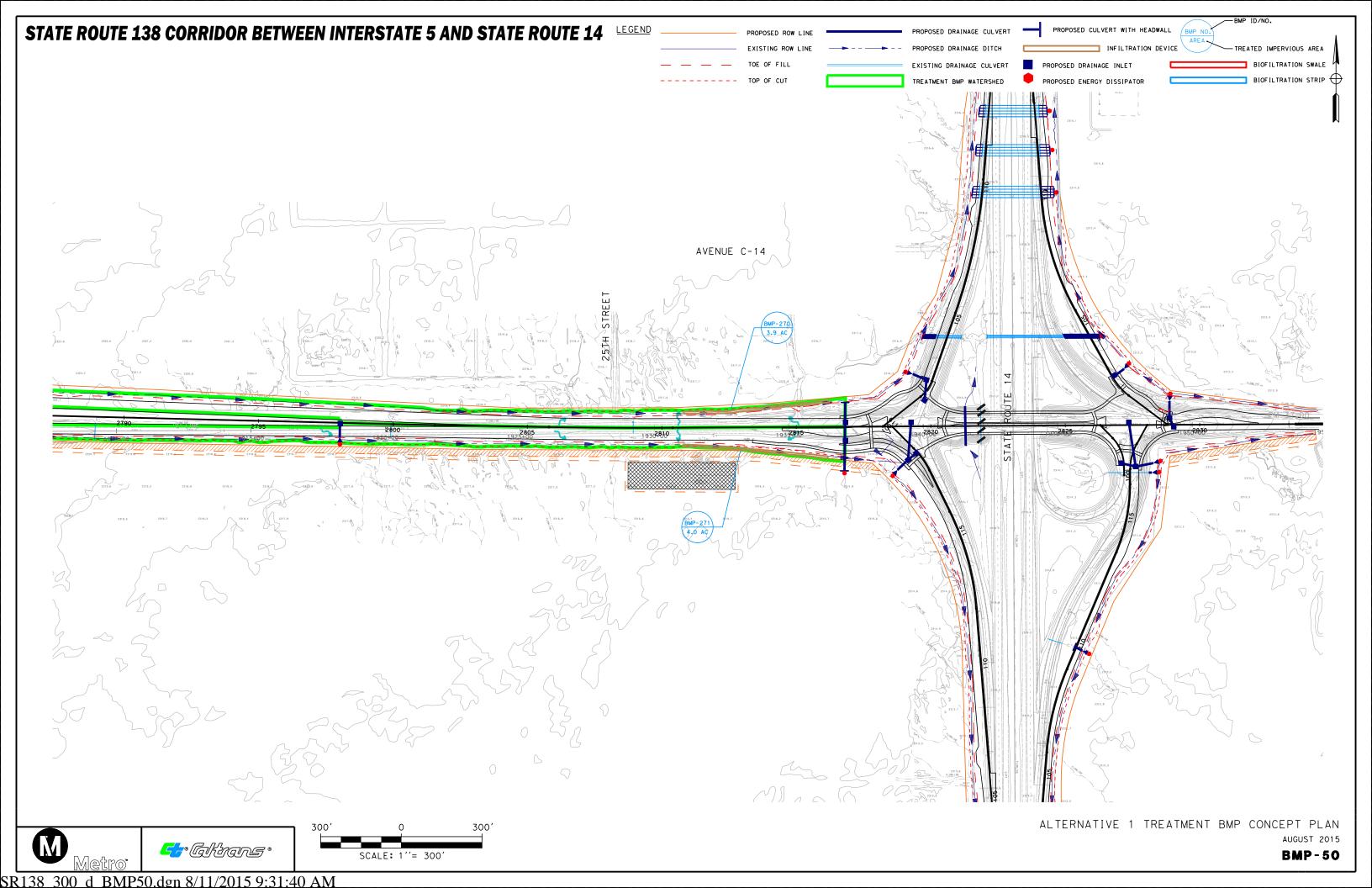


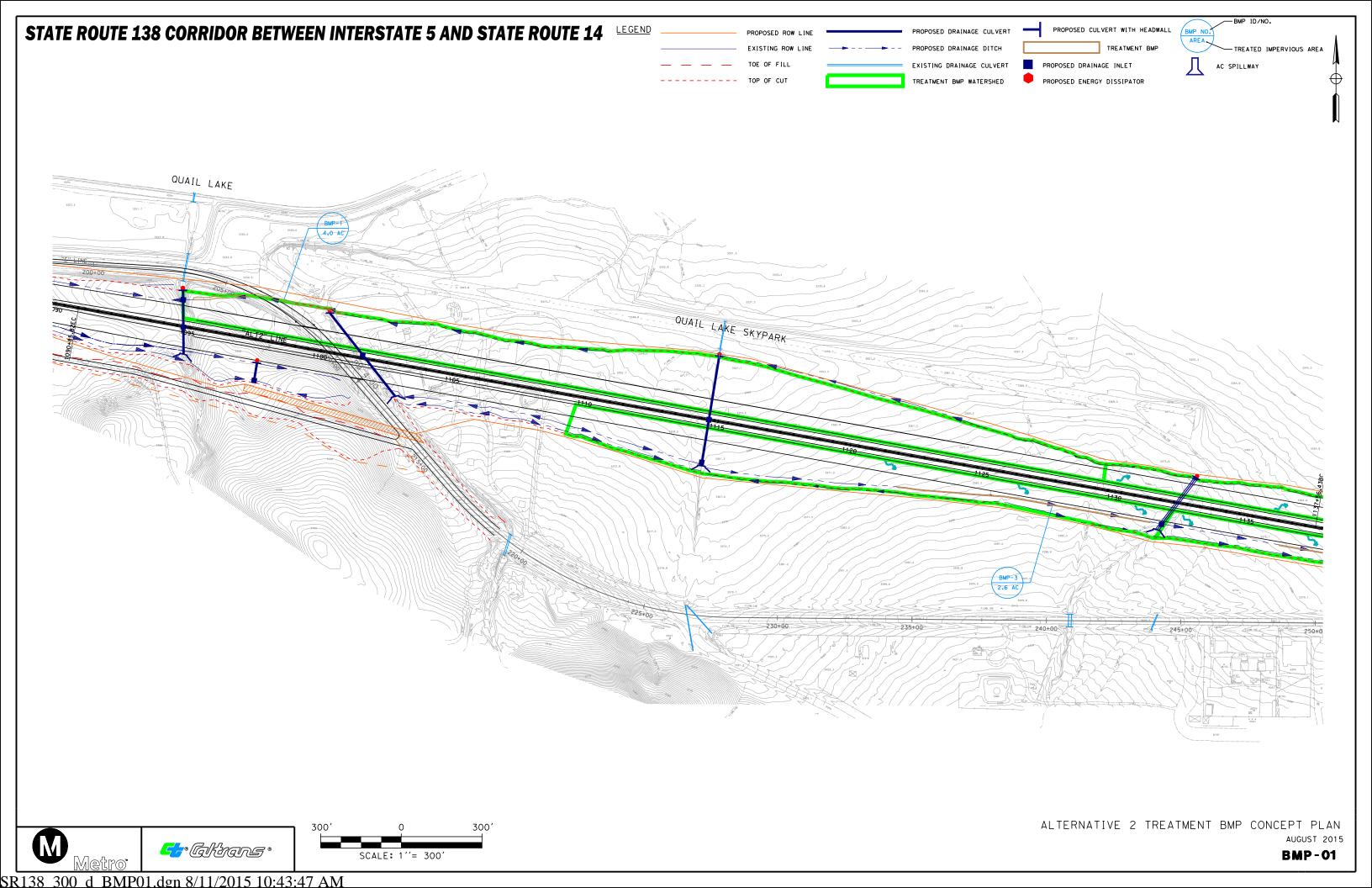


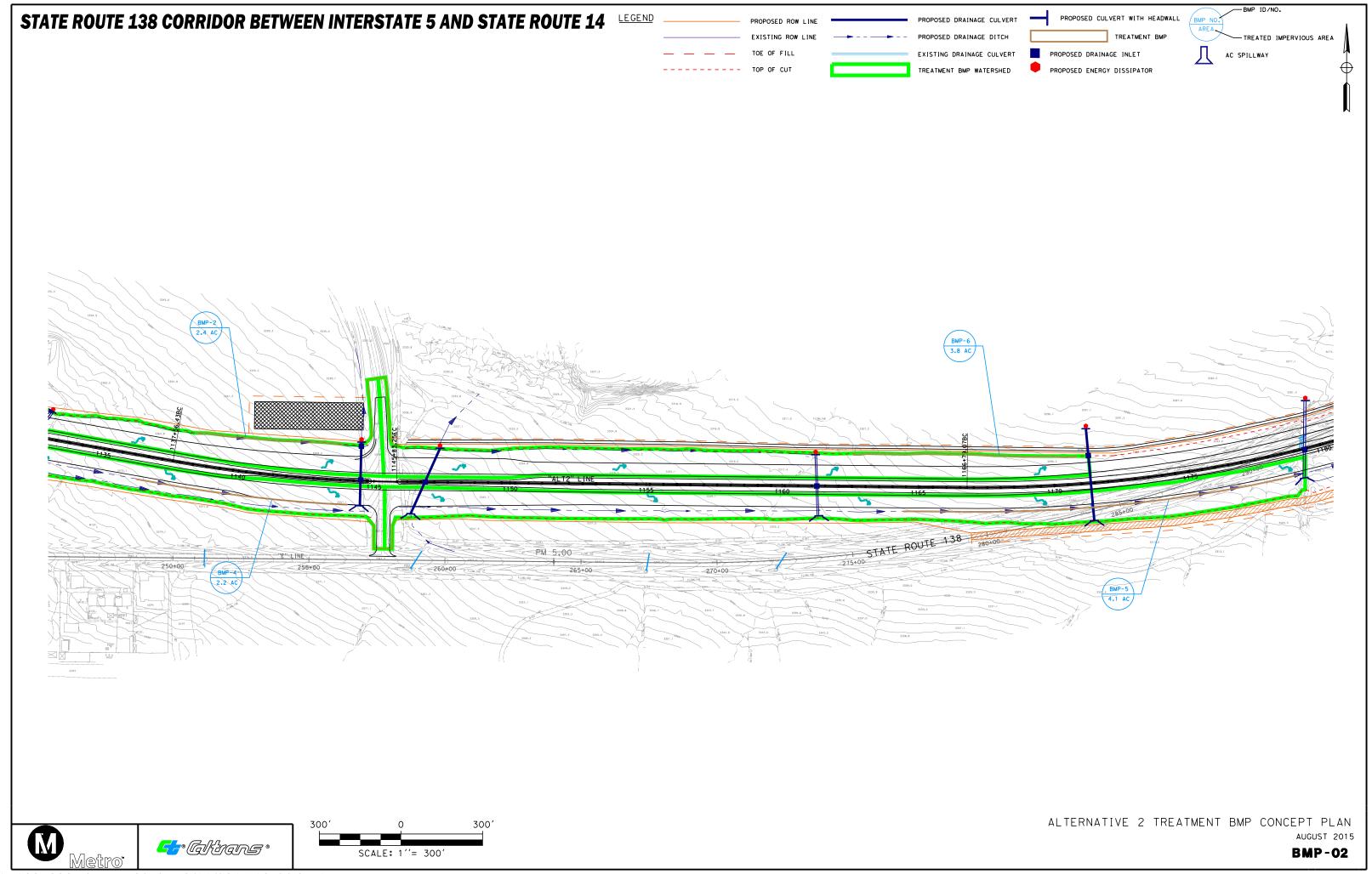


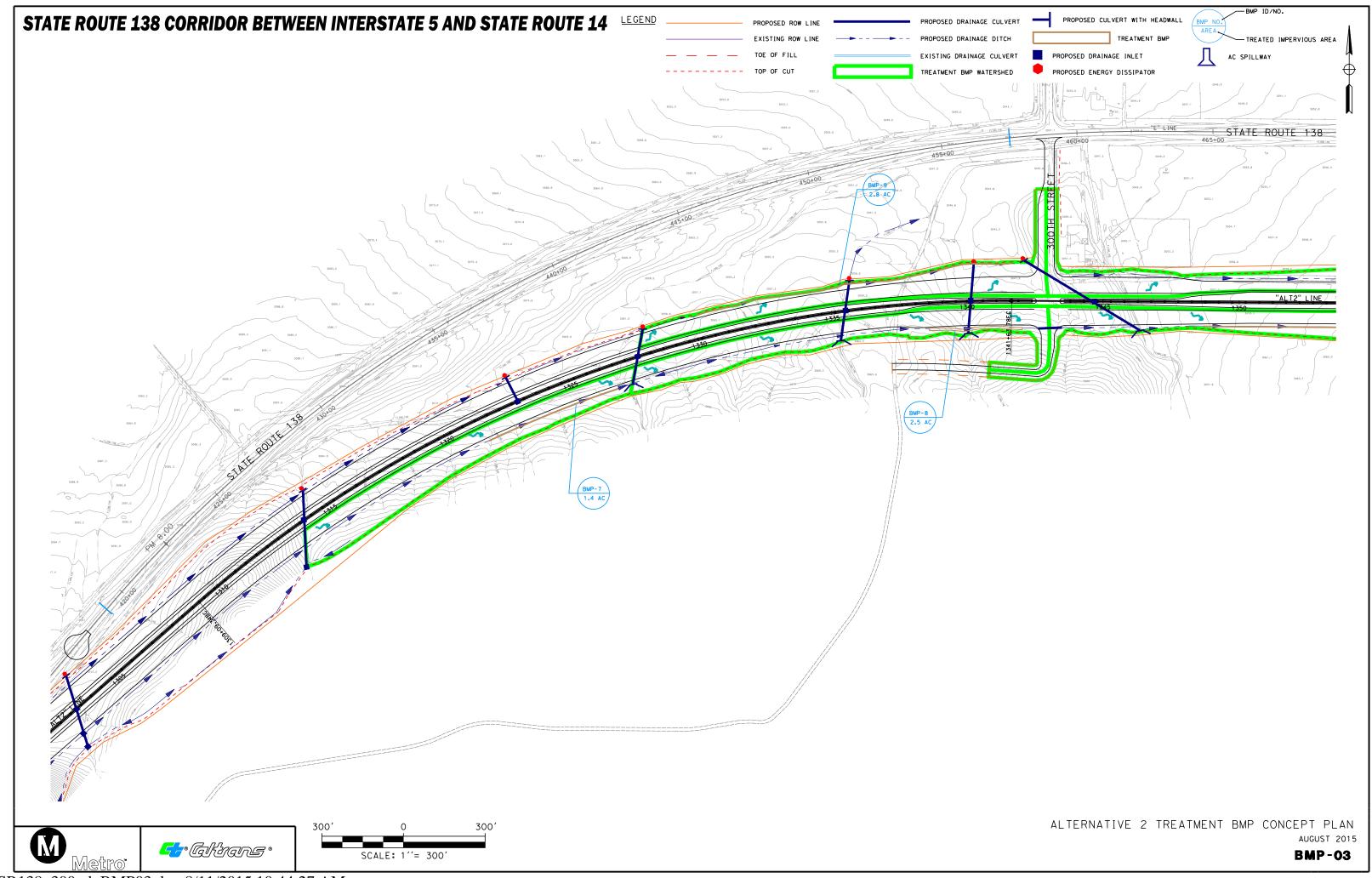


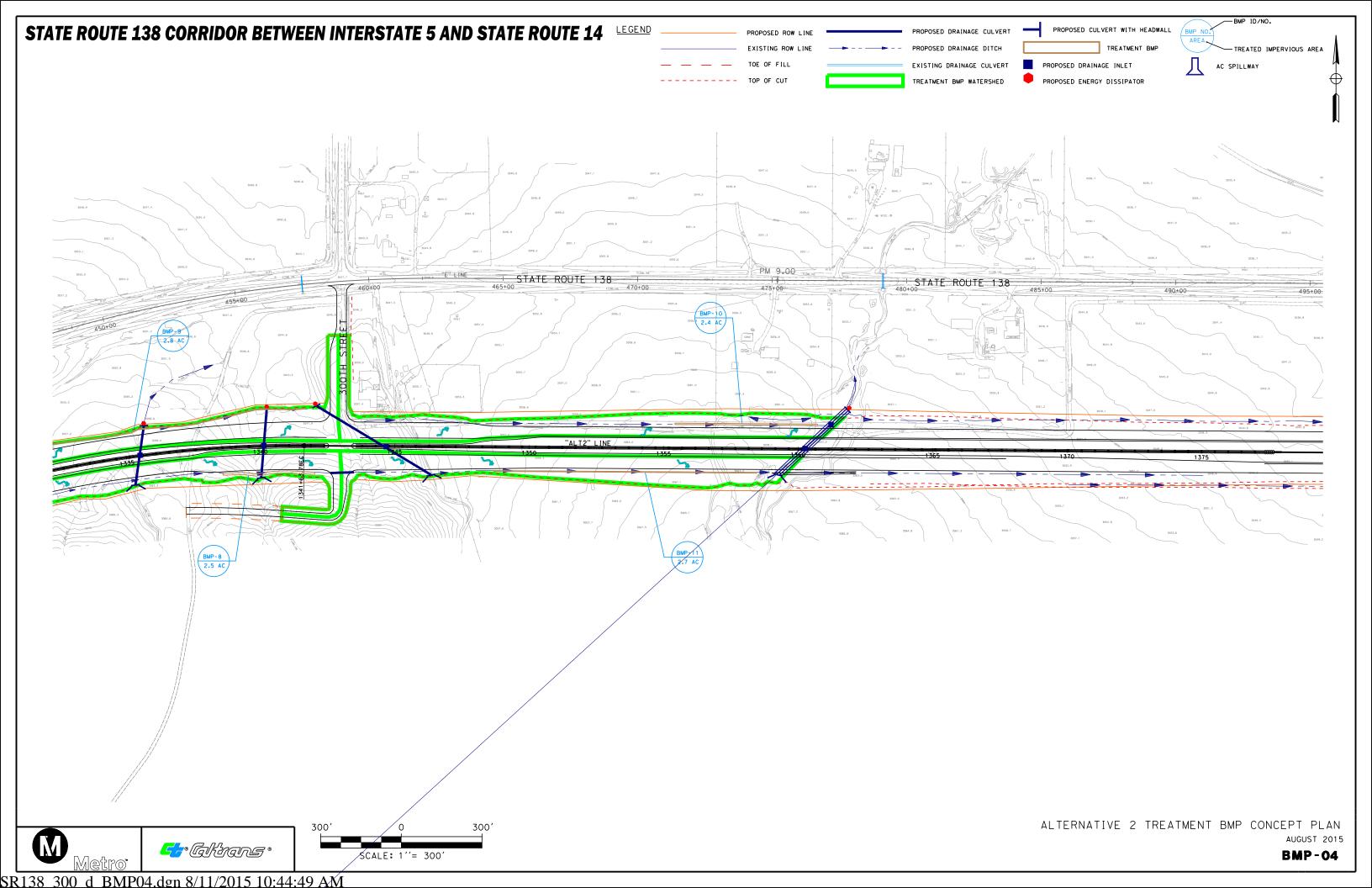


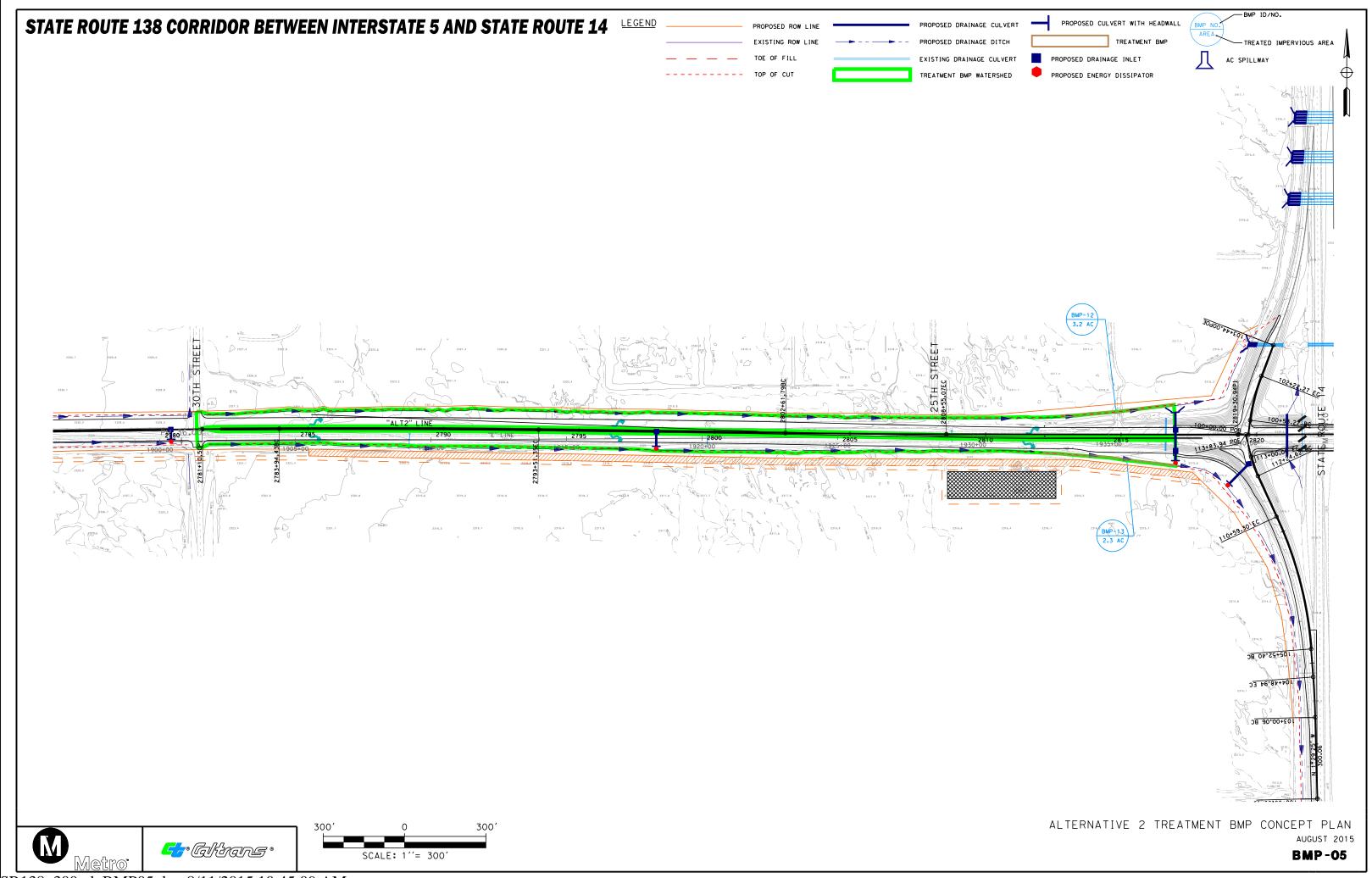


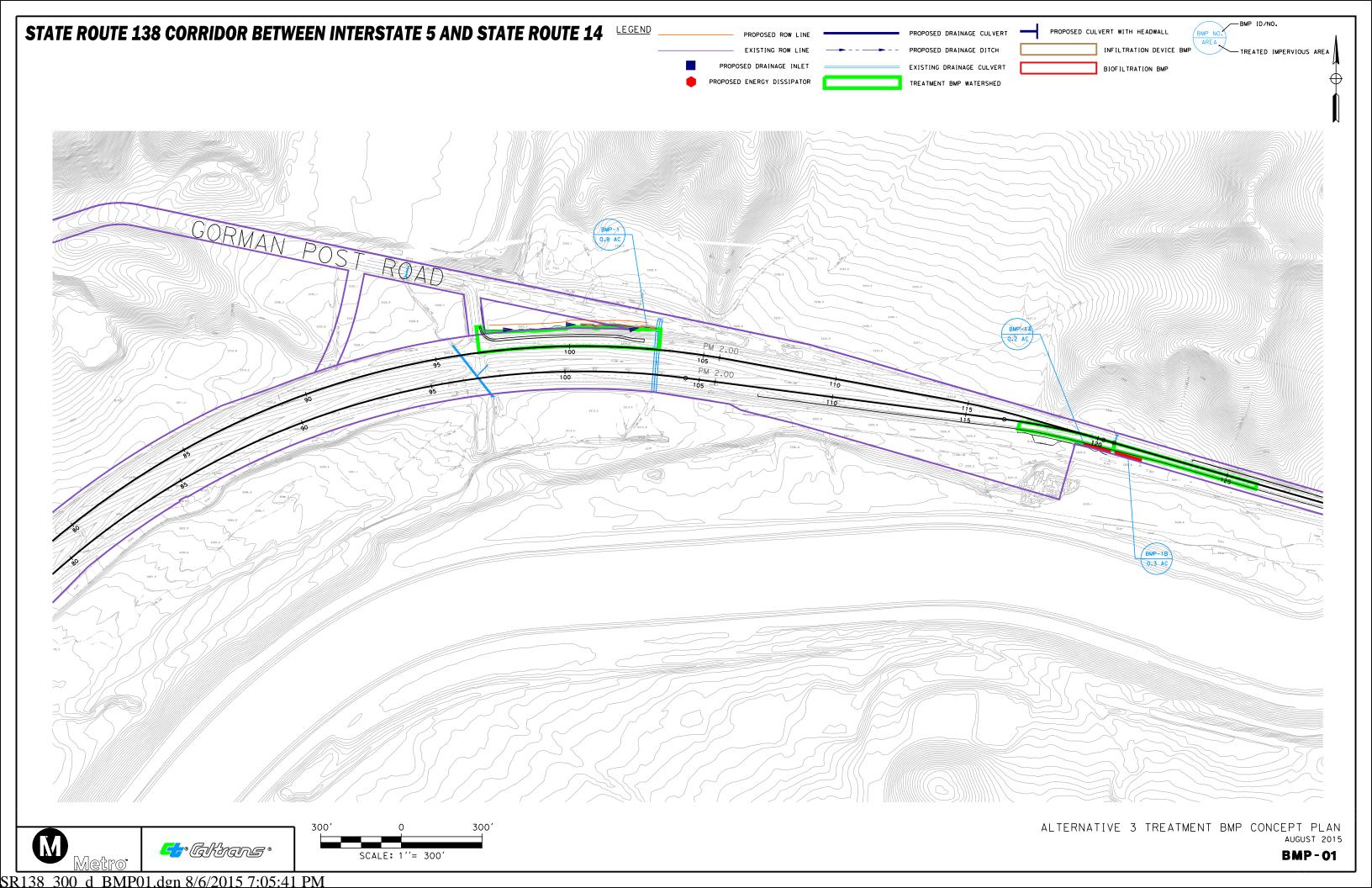


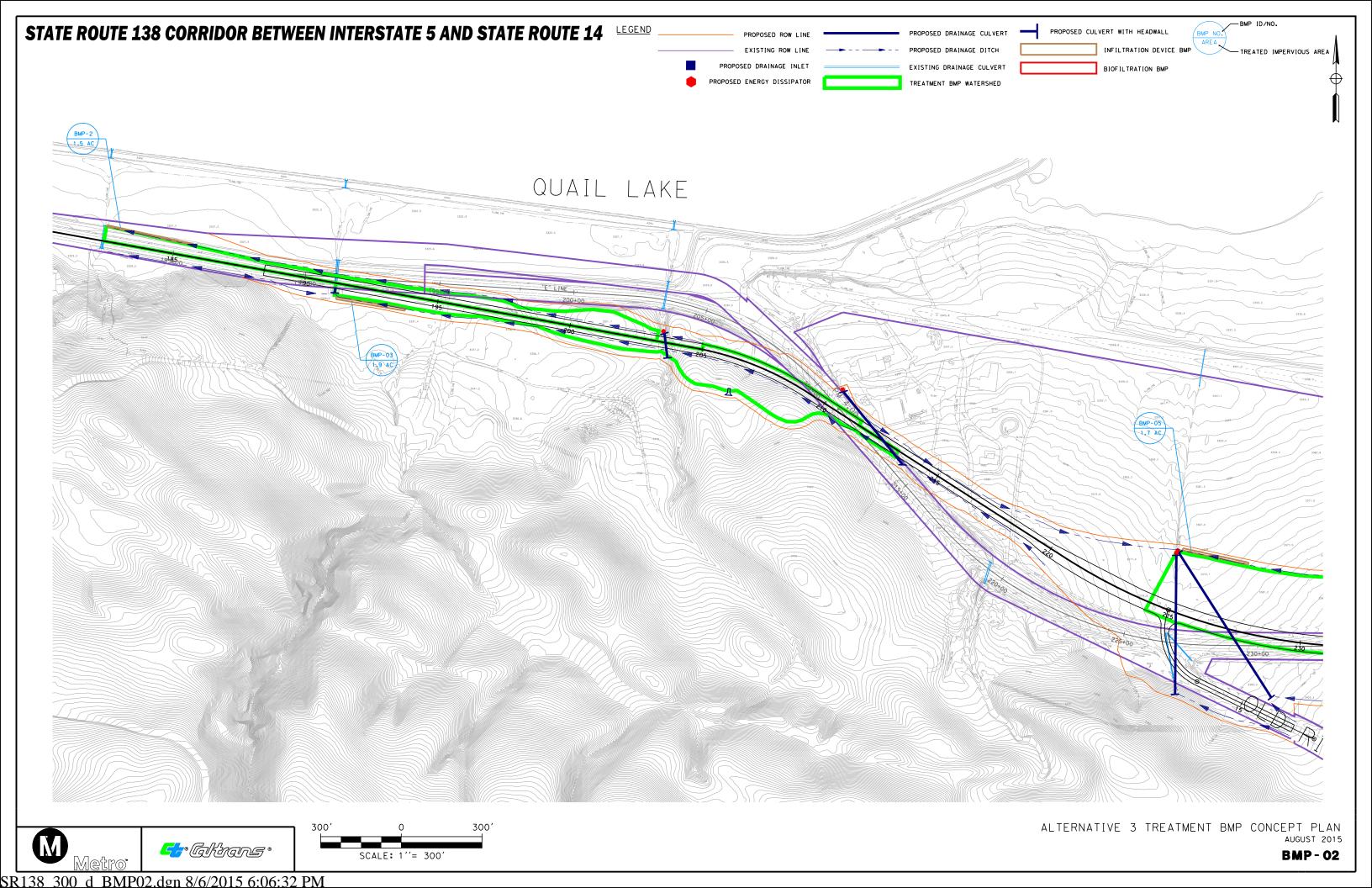


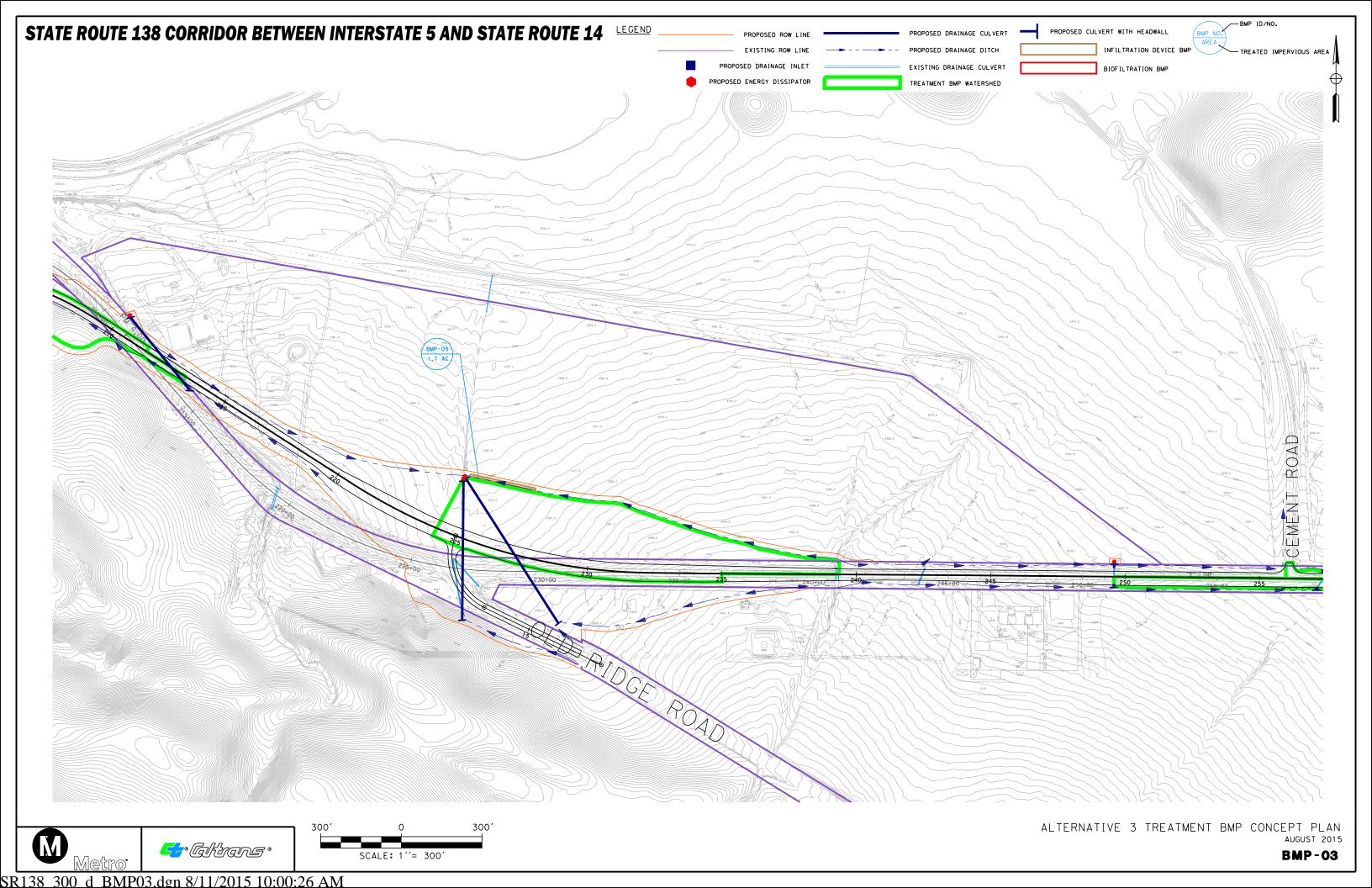


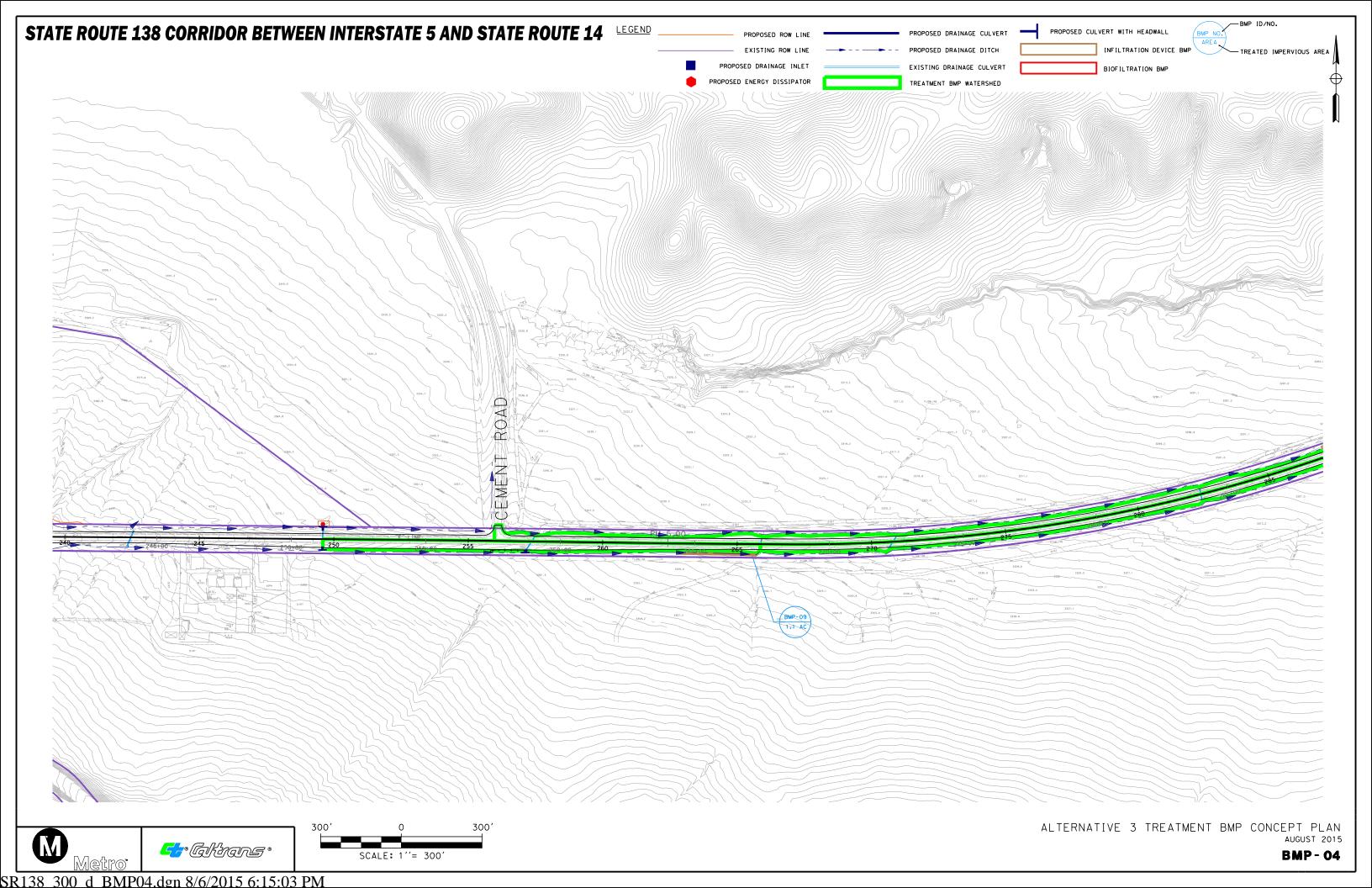


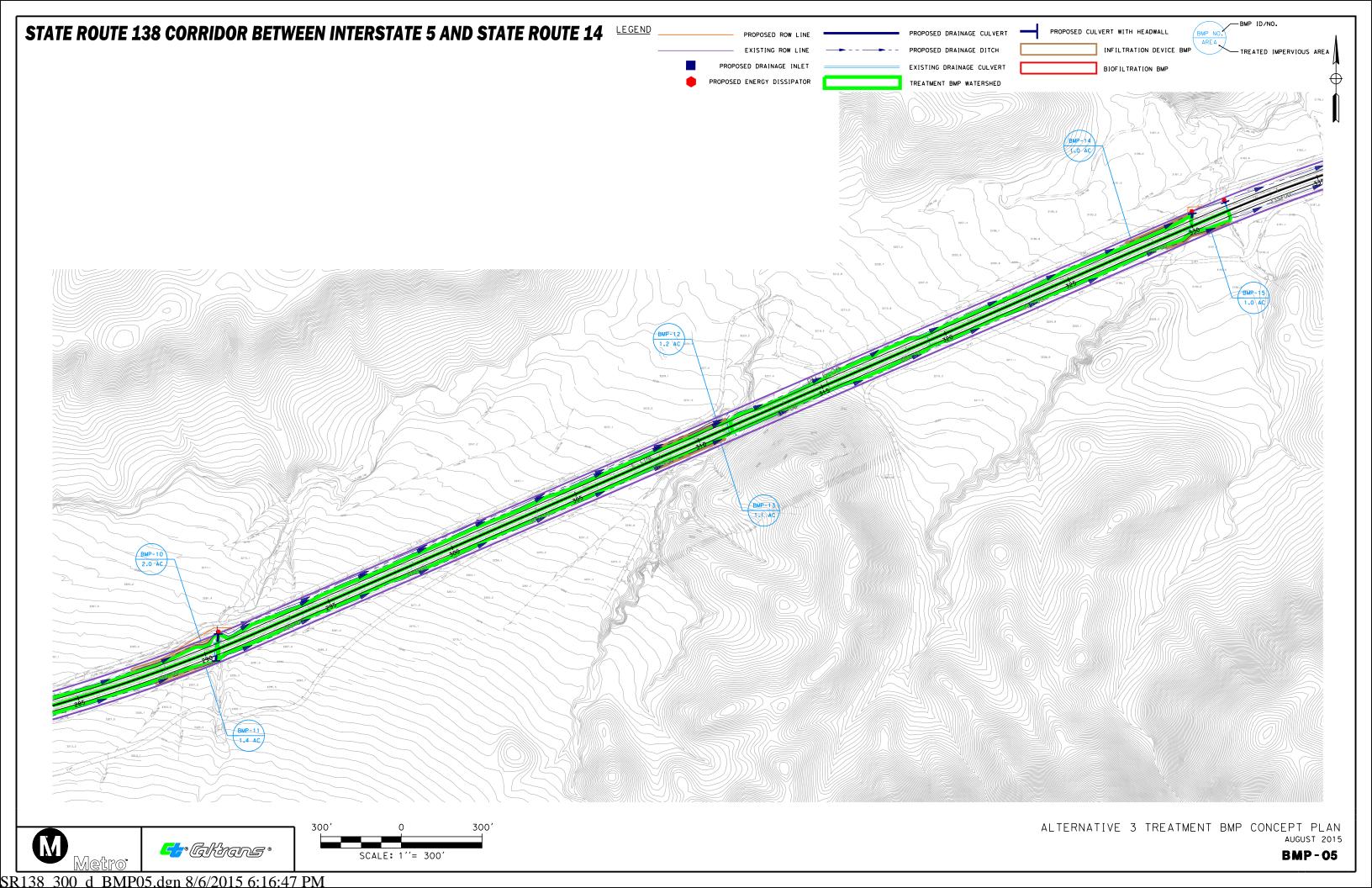


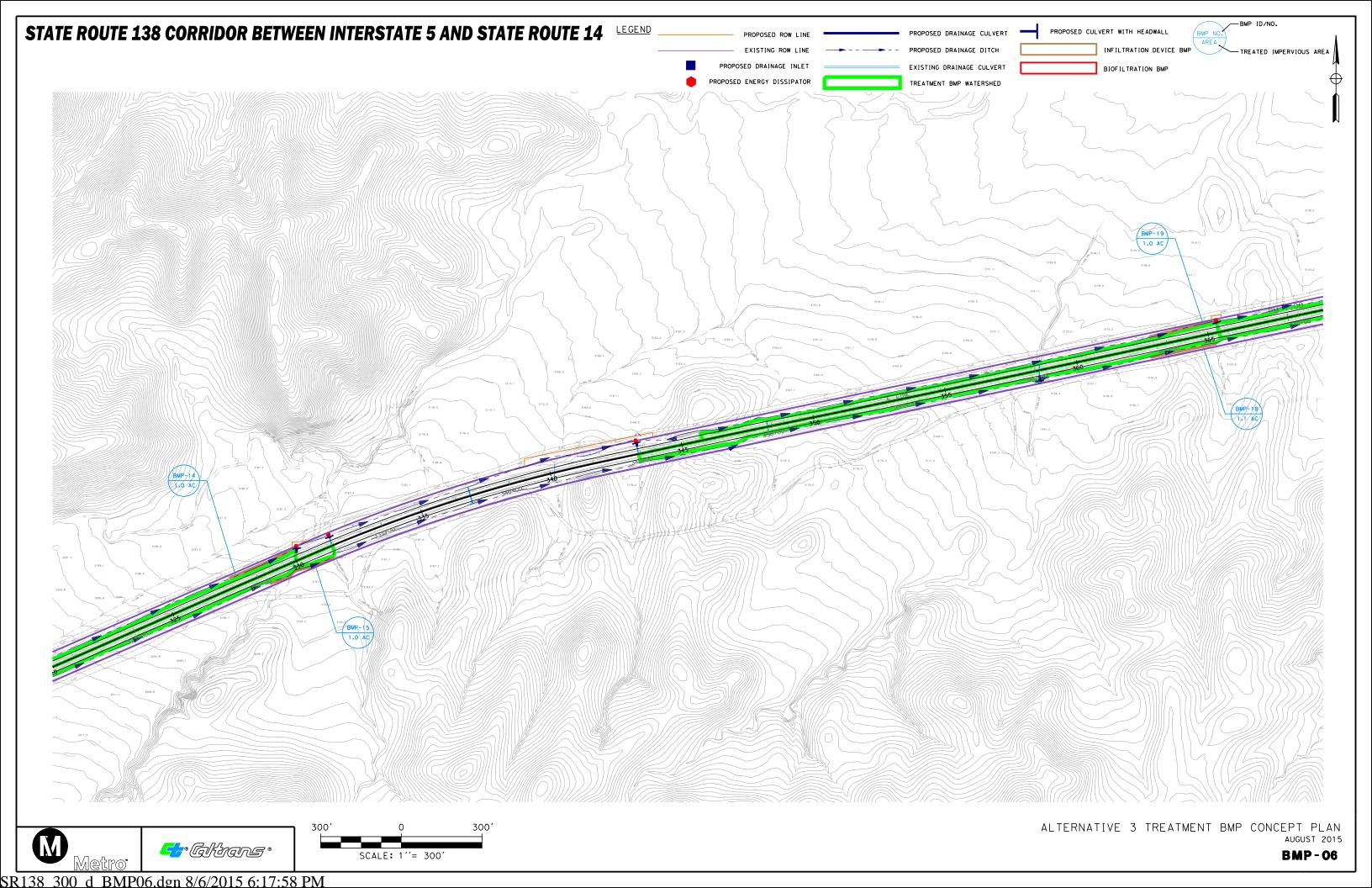


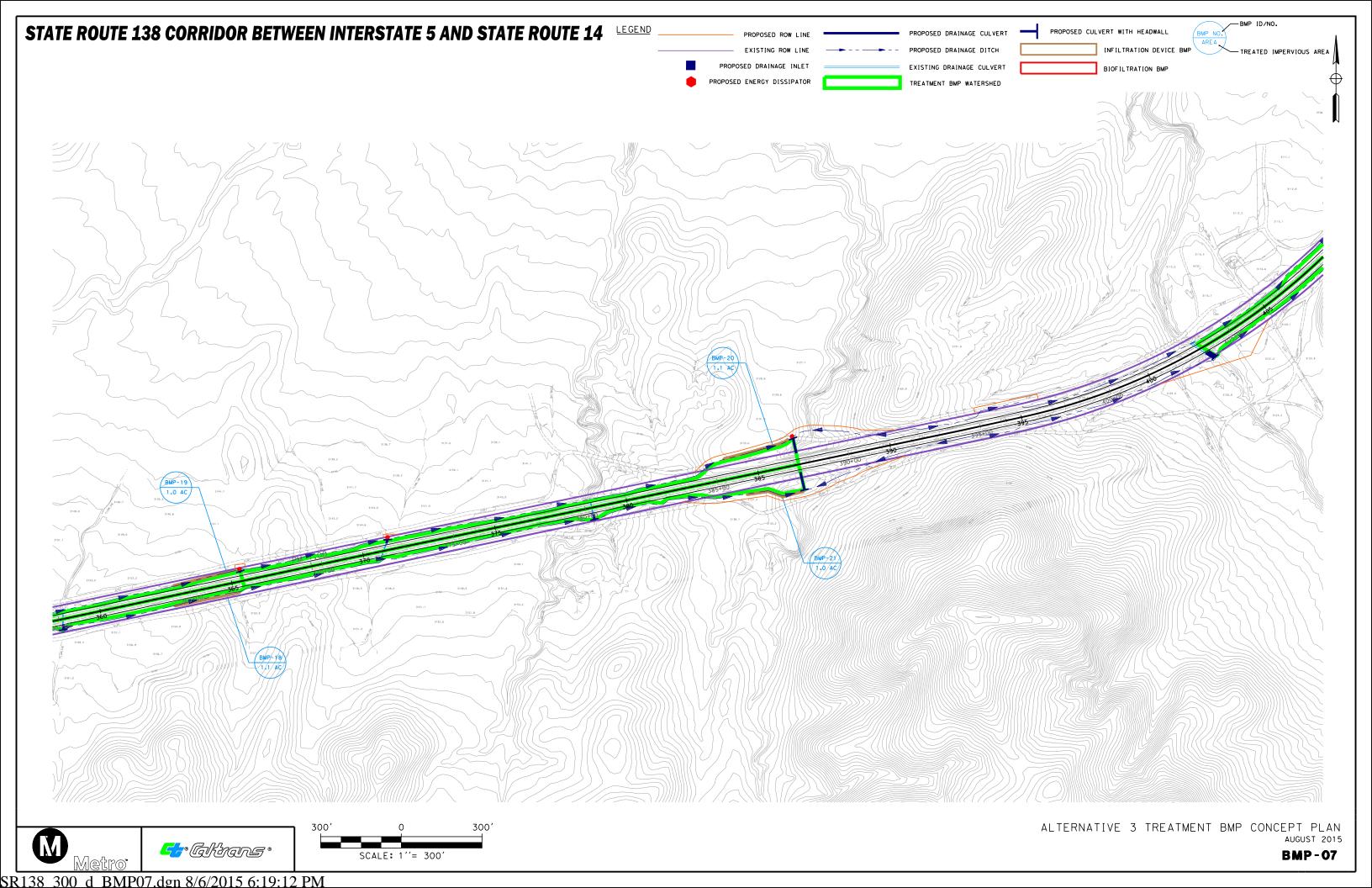


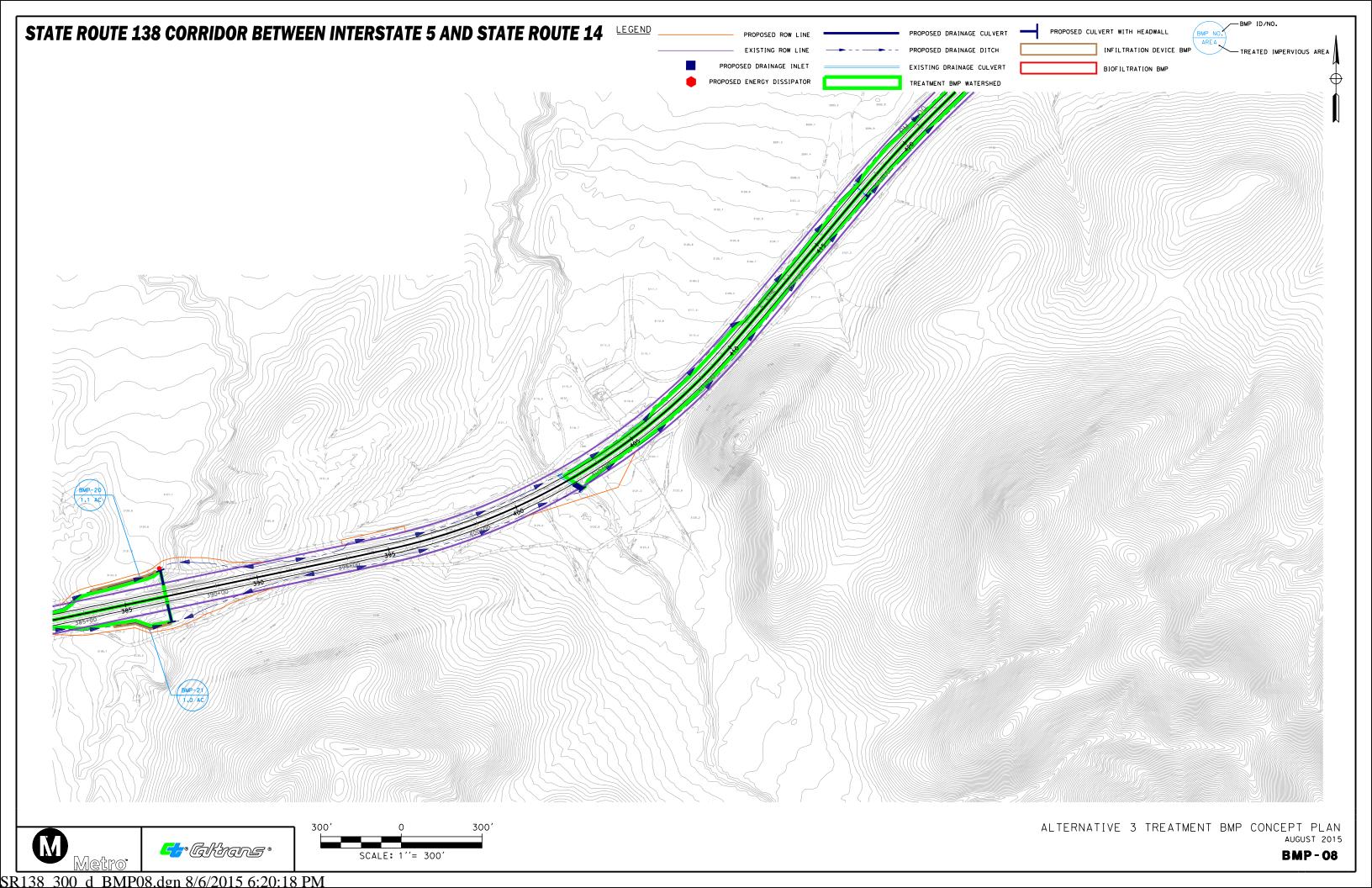


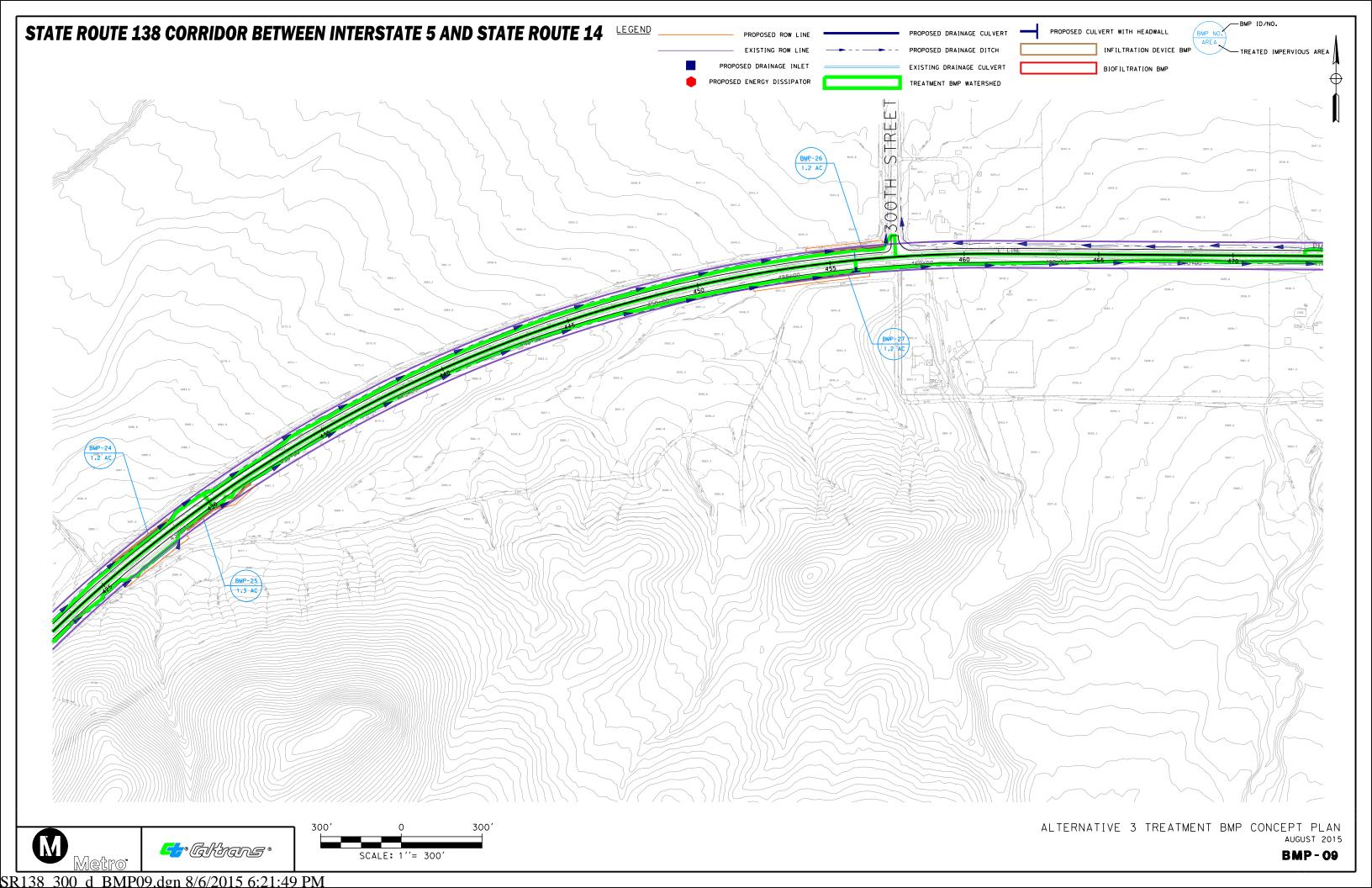


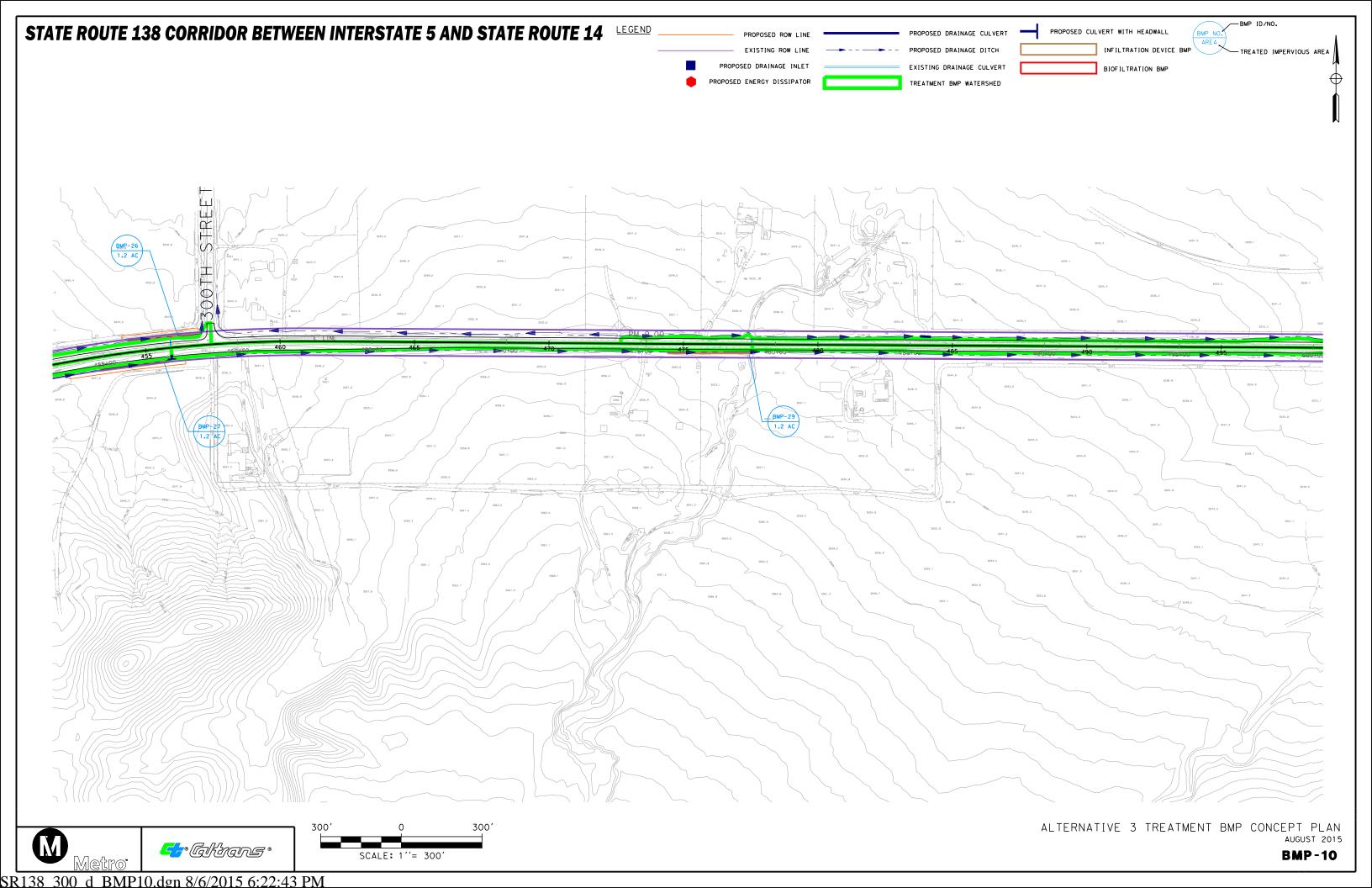


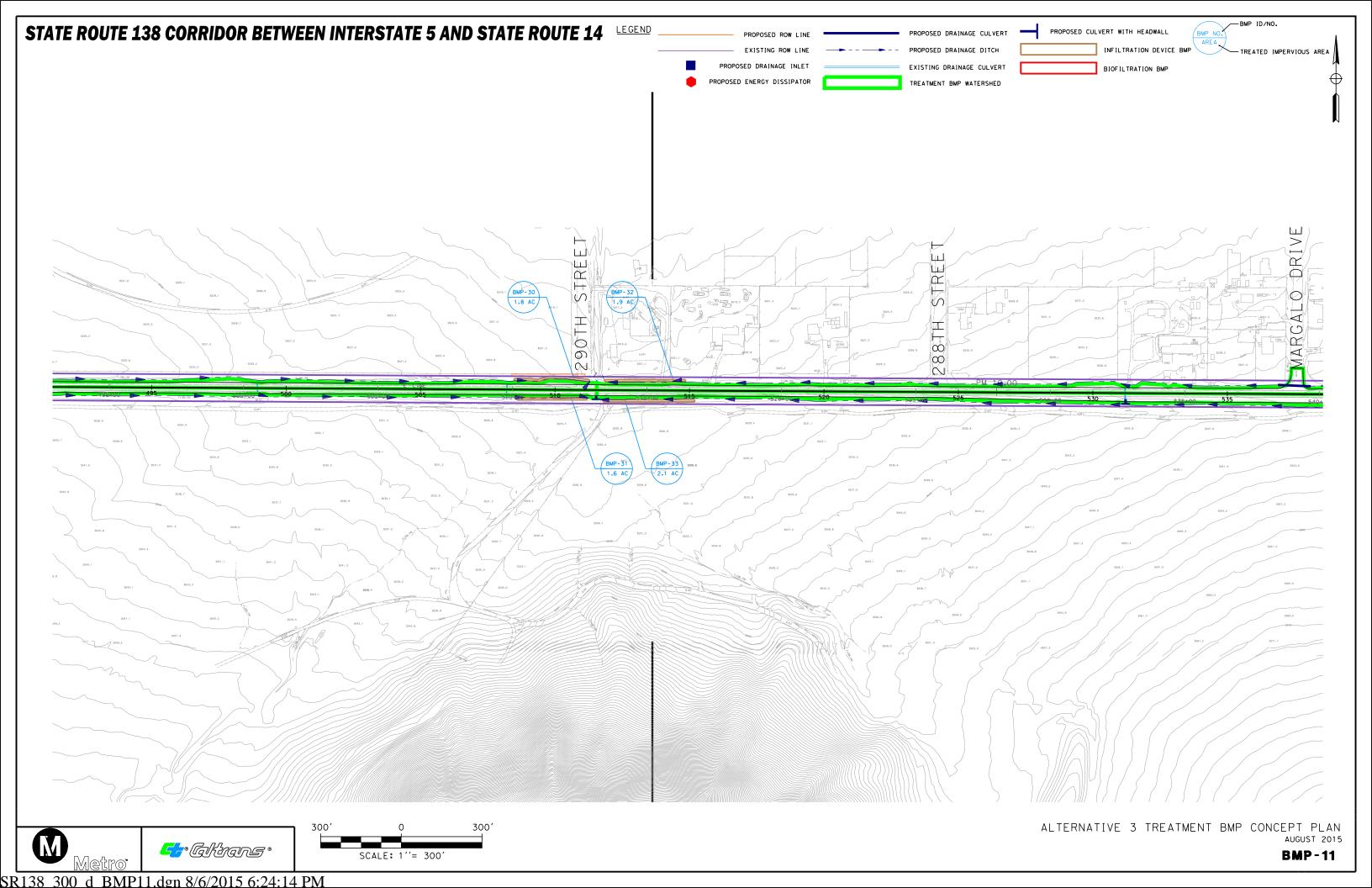


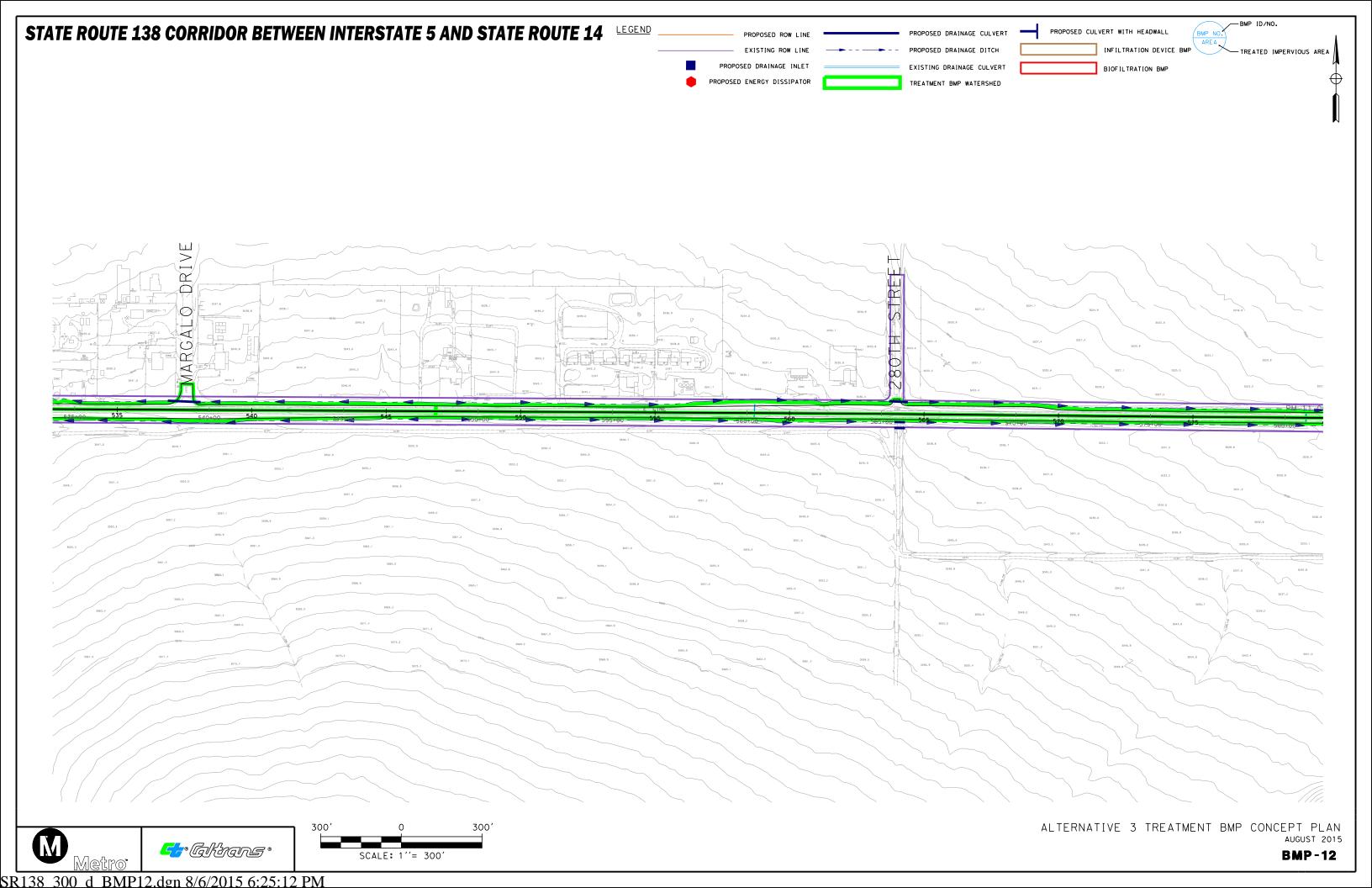


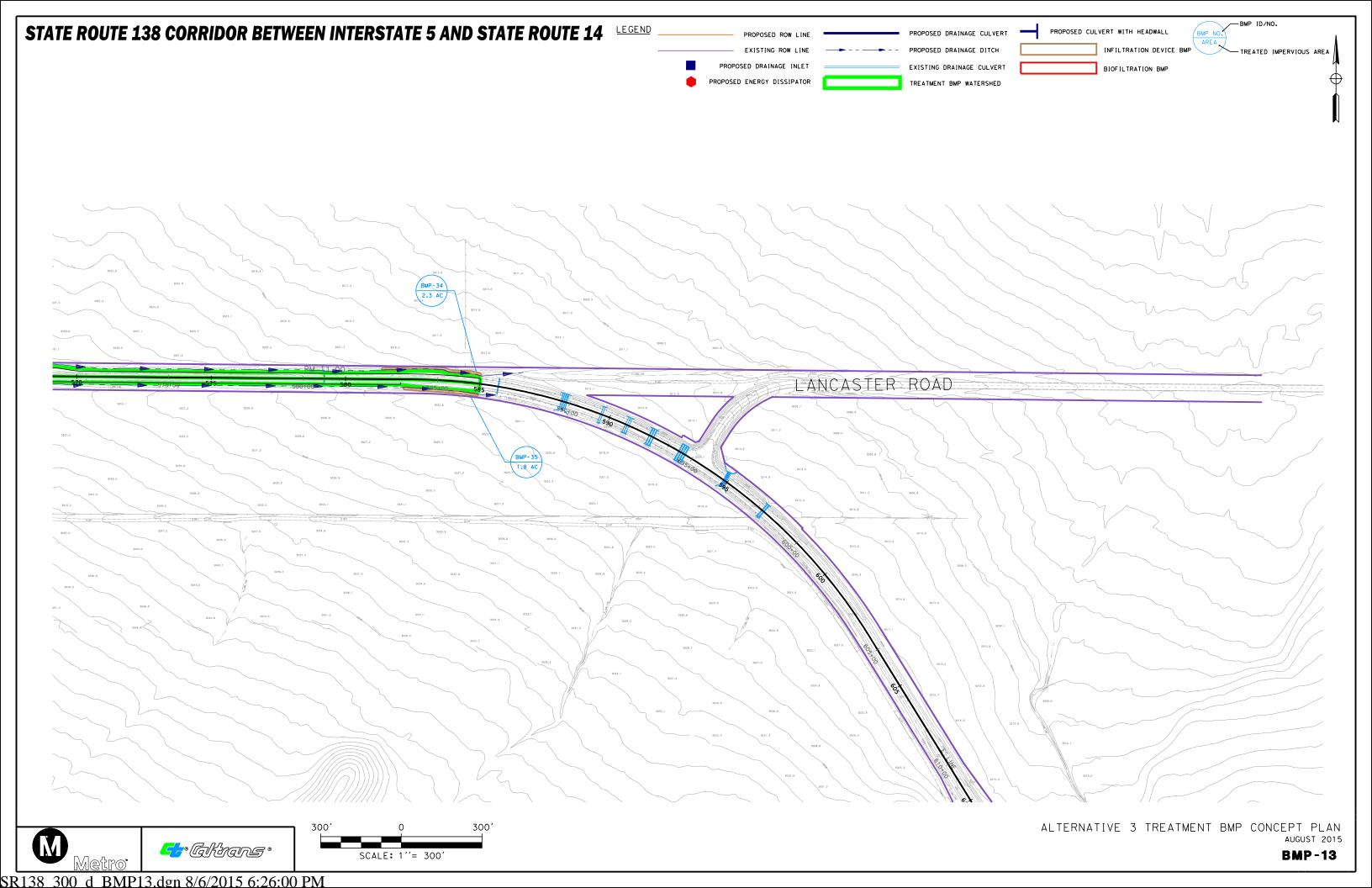


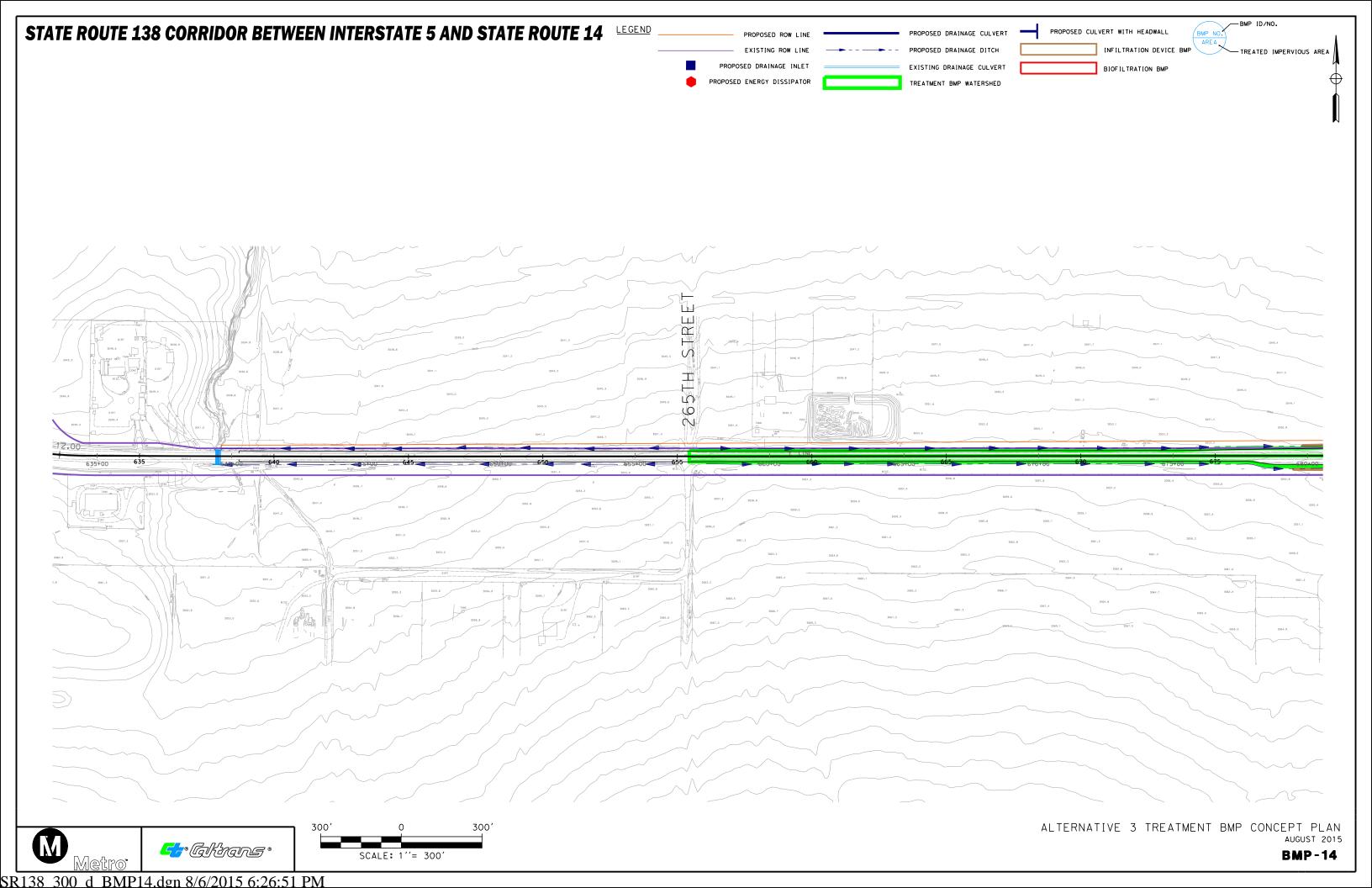


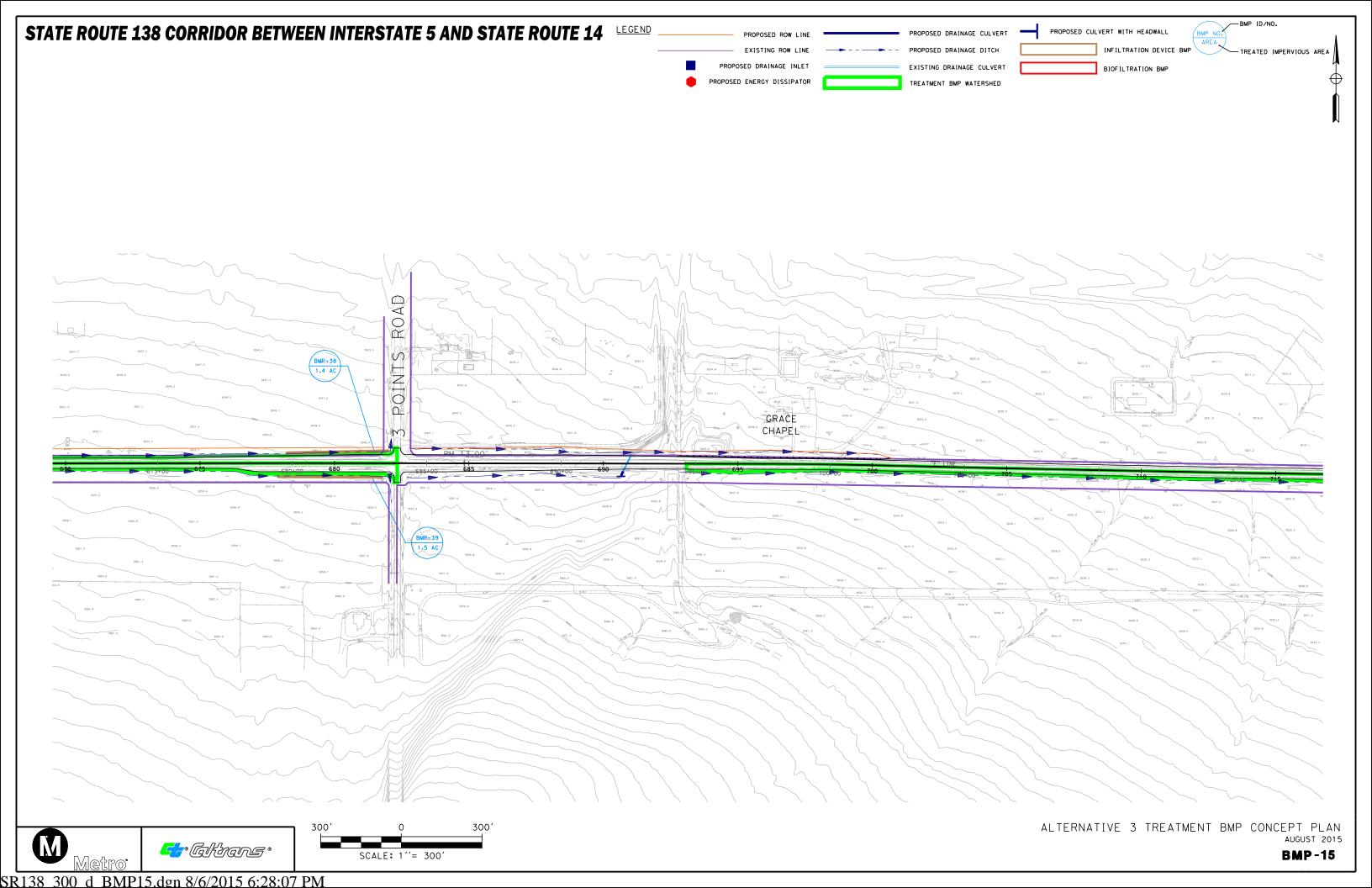


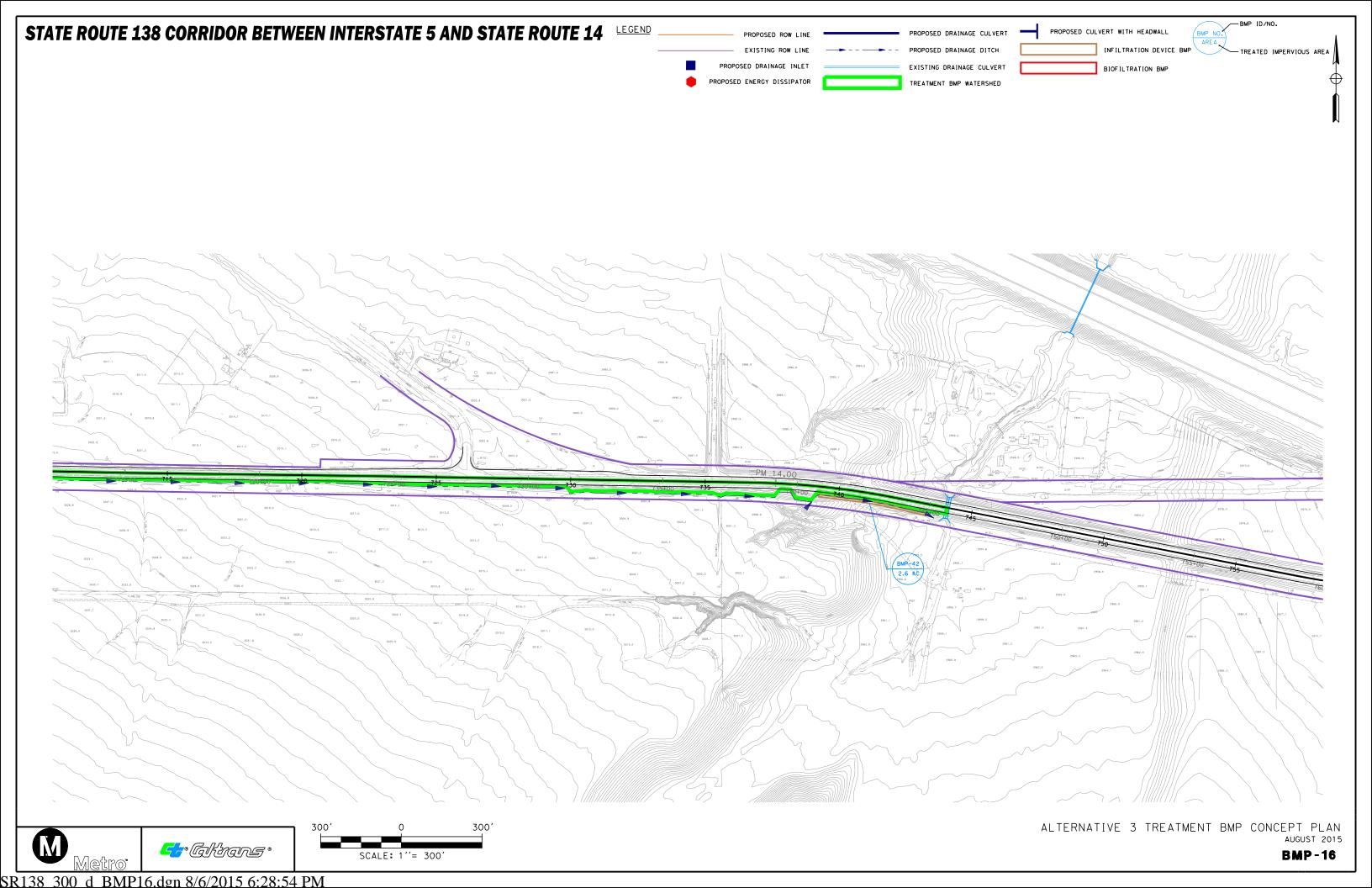












Checklist SW-1, Site Data Sources							
Prepared by: Vincent Chio	_Date:_	08/11/2015	_District-Co-Route:	07-LA-138			
PM : 0.0/36.8 Project ID (or E	EA):	EA 265100	_RWQCB: Lahontan a	nd Los Angeles			

Information for the following data categories should be obtained, reviewed and referenced as necessary throughout the project planning phase. Collect any available documents pertaining to the category and list them and reference your data source. For specific examples of documents within these categories, refer to Section 5.5 of this document. Example categories have been listed below; add additional categories, as needed. Summarize pertinent information in Section 2 of the SWDR.

DATA CATEGORY/SOURCES	Date
Topographic	
Topographic Survey and Aerial Photographs / LACMTA (Met	tro) July to Nov 2013
• 2' Contours / LAR-IAC.	Nov to Dec 2006
Hydraulic	
 Draft Preliminary Drainage Report / Kimley-Horn and Assoc 	siates January 2015
Soils	
 USDA NRCS Web Soil Survey (http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx) 	Access Date: February 2015
Draft Preliminary Geotechnical Report / Earth Mechanics, In	nc. December 2014
Climatic	
 Western Region Climate Center, Southern California Climate Summaries (http://www.wrcc.dri.edu/summary/Climsmsca.html 	
Water Quality	
 Caltrans Water Quality Planning Tool (http://svctenvims.dot.ca.gov/wqpt/wqpt.aspx) 	Access Date: January 2015
 303(d) List. Lahontan and Los Angeles Regional Water Qua Control Boards. (http://www.waterboards.ca.gov/lahontan (http://www.waterboards.ca.gov/losangeles/) 	
 Lahontan and Los Angeles RWQCB Basin Plan - Beneficial U (http://www.waterboards.ca.gov/rwqcb6/water_issues/probasin_plan/docs/ch2_beneficialuses.pdf) and ((http://www.waterboards.ca.gov/losangeles/water_issuesms/basin_plan/electronics_documents/BeneficialUseTable 	ograms/ Access Date: January 2015 s/progra
Water Quality Analysis Report. LSA.	In-Progress
Other Data Categories	
US EPA Discharge Mapping Tool (http://water.epa.gov/polwaste/npdes/stormwater/discharge.cfm	Access Date: January 2015

		Check	list SW-2, S	Storm	Water Qua	lity Issues S	Summary	
Pr	epared by	r: Vince	nt Chio	Date:_	08/11/2015	District-Co-Rou	te: 07-LA-13	3
PΝ	/I : <u> </u>	36.8	Project ID (or	EA):	EA 265100	RWQCB:_Lahor	ntan and Los Ang	geles
issu Lan	The following questions provide a guide to collecting critical information relevant to project stormwater quality issues. Complete responses to applicable questions, consulting other Caltrans functional units (Environmental, Landscape Architecture, Maintenance, etc.) and the District/Regional Storm Water Coordinator as necessary. Summarize pertinent responses in Section 2 of the SWDR.							
1.			ving waters that i (i.e., constructio					□NA
2.		roject limits nts of conc	s, list the 303(d) i ern.	mpaired r	eceiving water b	odies and their		□NA
3.	groundw	ater percola	re any municipal ation facilities wit and spill preventio	hin the pro	oject limits. Cons	sider appropriate		□NA
4.	Determinetc.	e the RWC	CB special requi	rements,	including TMDLs	s, effluent limits,		□NA
5.			ry agencies seaso estrictions require					□NA
6.	Determin	e if a 401 c	ertification will be	e required	.			□NA
7.	List rainy	season da	ites.					□NA
8.		e the gene tensity cur	ral climate of the es.	project a	rea. Identify anno	ual rainfall and	⊠ Complete	□NA
9.			ment BMPs, dete h to groundwater		soil classificatio	n, permeability,		□NA
10.	Determin	e contamin	ated soils within	the projec	ct area.		□ Complete	□NA
11.	Determin	e the total	disturbed soil are	a of the p	roject.			□NA
12.	Describe	the topogra	aphy of the proje	ct site.				□NA
13.		g. contrac	de of the Caltrans tor's staging yard					□NA
14.			nal right-of-way a design, constructi					□NA
15.	Determin	e if a right-	of-way certification	on is requ	ired.			□NA
16.	Treatmen		nated unit costs for abilized conveya	_	•			□NA
17.	Determin	e if project	area has any slo	pe stabiliz	zation concerns.		⊠ Complete	□NA
18.	Describe	the local la	and use within the	e project a	area and adjacer	nt areas.		□NA
19.	Evaluate	the presen	ce of dry weathe	r flow.			Complete	⊠NA

C	Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water Impacts								
Pre	pare	ed by: Vincen	t Chio	_Date:_	08/11/2015	District-Co-F	Route:	07-LA-138	3
PM	ı :	0.0/36.8	_Project ID (or E	:A):	EA 265100	RWQCB: <u>La</u>	hontan an	d Los Ang	jeles
Ma	The PE must confer with other functional units, such as Landscape Architecture, Hydraulics, Environmental, Materials, Construction and Maintenance, as needed to assess these issues. Summarize pertinent responses in Section 2 of the SWDR.								
Op	tions	for avoiding or r	educing potential	impacts	during project pl	anning include	the following	ng:	
1.	rec are	eiving waters or	relocated or realig to increase the pr plains, steep slop ditions?	eservati	on of critical (or p	oroblematic)	∐Yes	□No	□NA
2.			bridges be desigr ze construction in		cated to reduce	work in live	□Yes	□No	□NA
3.		n any of the follo	wing methods be	utilized 1	to minimize erosi	on from			
	a.	Disturbing exist	ing slopes only w	hen nec	essary?		⊠Yes	□No	□NA
	b.	Minimizing cut a	and fill areas to re	duce slo	ppe lengths?		⊠Yes	□No	□NA
	C.	Incorporating reshorten slopes?	etaining walls to re	educe st	eepness of slope	es or to	⊠Yes	□No	□NA
	d.	Acquiring right- reduce steepne	of-way easements	s (such a	as grading easen	nents) to	∐Yes	□No	⊠NA
	e.	Avoiding soils o stabilize?	or formations that	will be p	articularly difficul	t to re-	⊠Yes	□No	□NA
	f.		nd fill slopes flat e pre-construction r		o allow re-vegeta	tion and	⊠Yes	□No	□NA
	g.	Providing bench concentration o	nes or terraces or flows?	high cu	it and fill slopes t	o reduce	⊠Yes	□No	□NA
	h.	Rounding and s	shaping slopes to	reduce o	concentrated flov	v?	⊠Yes	□No	□NA
	i.	Collecting conc	entrated flows in s	stabilize	d drains and cha	nnels?	⊠Yes	□No	□NA
4.	Do	es the project de	sign allow for the	ease of	maintaining all B	MPs?	⊠Yes	□No	
5.		n the project be s ring the rainy sea	scheduled or phas son?	sed to m	inimize soil-distu	rbing work	⊠Yes	□No	
6.	vec	getated slopes, bastruction proces	rm water pollution asins, and convey s to provide addit construction storr	ance sy ional pro	stems be installed to postection and to postection	ed early in the	⊠Yes	□No	□NA

Design Pollution Provention PMPs									
Design Pollution Prevention BMPs Checklist DPP-1, Part 1									
Prepared by: Vincent Chio Date: 08/11/2015 District-Co-F	Route:	07-LA-13	8						
PM : 0.0/36.8 Project ID (or EA): EA 265100 RWQCB: La	hontan a	nd Los An	geles						
Consideration of Design Pollution Prevention BMPs			-						
Consideration of Design Foliation Free fiction Divir s									
Consideration of Downstream Effects Related to Potentially Increased Flow [to streams or channels]									
Will project increase velocity or volume of downstream flow?	⊠Yes	□No	□NA						
Will the project discharge to unlined channels?	⊠Yes	□No	□NA						
Will project increase potential sediment load of downstream flow?	⊠Yes	□No	□NA						
Will project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability?	⊠Yes	□No	□NA						
If Yes was answered to any of the above questions, consider Downstream Effects Related to Potentially Increased Flow , complete the DPP-1, Part 2 checklist.									
Slope/Surface Protection Systems									
Will project create new slopes or modify existing slopes?	⊠Yes	□No	□NA						
If Yes was answered to the above question, consider Slope/Surface Protection Systems , complete the DPP-1, Part 3 checklist.									
Concentrated Flow Conveyance Systems									
Will the project create or modify ditches, dikes, berms, or swales?	⊠Yes	□No	□NA						
Will project create new slopes or modify existing slopes?	⊠Yes	□No	□NA						
Will it be necessary to direct or intercept surface runoff?	⊠Yes	□No	□NA						
Will cross drains be modified?	⊠Yes	□No	□NA						
If Yes was answered to any of the above questions, consider Concentrated Flow Conveyance Systems ; complete the DPP-1, Part 4 checklist.									
Preservation of Existing Vegetation									
It is the goal of the Storm Water Program to maximize the protection of desirable existing vegetation to provide erosion and sediment control benefits on all projects.		⊠Comple [.]	te						
Consider Preservation of Existing Vegetation , complete the DPP-1, Part 5 checklist.									

	Design Pollution Prevention BMPs								
	Checklist DPP-1, Part 2								
Pre	epared by: Vincent ChioDate:08/11/2015District-Co-Route:	07-LA-138							
PM	I: 0.0/36.8 Project ID (or EA): EA 265100 RWQCB: Lahontan an	d Los Angeles							
Do	wnstream Effects Related to Potentially Increased Flow								
1.	Review total paved area and reduce to the maximum extent practicable.	⊠ Complete							
2.	Review channel lining materials and design for stream bank erosion control.	⊠ Complete							
	(a) See Chapters 860 and 870 of the HDM.								
	(b) Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.								
3.	Include, where appropriate, energy dissipation devices at culvert outlets.	⊠ Complete							
4.	Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.	☐Complete							
5.	Include, if appropriate, peak flow attenuation basins or devices to reduce peak discharges.								
6.	Calculate the water quality volume infiltrated by DPP BMPs within the project limits. Include the percentage of the water quality volume for each BMP and	□Complete							

subwatershed, as appropriate, for site conditions. These calculations will be used

later in the T-1 checklist.

	Design Pollution Prevention BMPs		
	Checklist DPP-1, Part 3		
Pre	epared by: Vincent Chio Date: 08/11/2015 District-Co-Route:	07-LA-138	3
PΝ	1 : <u>0.0/36.8</u> Project ID (or EA): <u>EA 265100</u> RWQCB: <u>Lahontan ar</u>	nd Los Ang	geles
Slo	ope / Surface Protection Systems		
1.	What are the proposed areas of cut and fill? (attach plan or map)	⊠Con	nplete
2.	Were benches or terraces provided on high cut and fill slopes to reduce concentration of flows?	∐Yes	□No
3.	Were slopes rounded and/or shaped to reduce concentrated flow?	⊠Yes	□No
4.	Were concentrated flows collected in stabilized drains or channels?	⊠Yes	□No
5.	Are new or disturbed slopes > 4:1 horizontal:vertical (h:v)?	⊠Yes	□No
	If Yes, District Landscape Architect must prepare or approve an erosion control plan, at the District's discretion.		
6.	Are new or disturbed slopes > 2:1 (h:v)?	∐Yes	⊠No
	If Yes, Geotechnical Services must prepare a Geotechnical Design Report, and the District Landscape Architect should prepare or approve an erosion control plan. Concurrence must be obtained from the District Maintenance Storm Water Coordinator for slopes steeper than 2:1 (h:v).		
7.	Estimate the net new impervious area that will result from this project. <u>414</u> acres (Alternative 1)	⊠Con	nplete
۷E	GETATED SURFACES		
1.	Identify existing vegetation.	☐Con	nplete
2.	Evaluate site to determine soil types, appropriate vegetation and planting strategies.	☐Con	nplete
3.	How long will it take for permanent vegetation to establish?	☐Con	nplete
4.	Minimize overland and concentrated flow depths and velocities.	⊠Con	nplete
HA	ARD SURFACES		
1.	Are hard surfaces required?	∐Yes	⊠No
	If Yes, document purpose (safety, maintenance, soil stabilization, etc.), types, and general locations of the installations.	Соі	mplete
	view appropriate SSPs for Vegetated Surface and Hard Surface Protection stems.	□Coı	mplete

□ Complete

	Design Pollution Prevention BMPs									
	Checklist DPP-1, Part 4									
Pre	epared by: <u>Vincent Chio</u> Da	te:_	08/11/2015	District-Co-Route:	07-LA-138					
PM	1: 0.0/36.8 Project ID (or EA):		EA 265100	RWQCB: Lahontan	and Los Angeles					
Со	oncentrated Flow Conveyance Syster	ns								
Dit	tches, Berms, Dikes and Swales									
1.	Consider Ditches, Berms, Dikes, and S and Chapter 860 of the HDM.	wal	es as per Topic	s 813, 834.3, and 835,						
2.	Evaluate risks due to erosion, overtopp	ing,	flow backups of	or washout.						
3.	Consider outlet protection where localize	ed	scour is anticipa	ated.						
4.	Examine the site for run-on from off-site	so	urces.							
5.	Consider channel lining when velocities	ex	ceed scour velo	ocity for soil.						
Ov	verside Drains									
1.	Consider downdrains, as per Index 834	.4 c	of the HDM.		□Complete					
2.	Consider paved spillways for side slope	s fl	atter than 4:1 h	v.	Complete					
Fla	ared Culvert End Sections									
1.	Consider flared end sections on culvert the HDM.	inle	ets and outlets a	as per Chapter 827 of						
Ou	utlet Protection/Velocity Dissipation De	vic	es							
1.	Consider outlet protection/velocity dissi drains, as per Chapters 827 and 870 of			utlets, including cross						

Review appropriate SSPs for Concentrated Flow Conveyance Systems.

□No

	Design Pollution Prevention BMPs Checklist DPP-1, Part 5								
Pre	Prepared by: Vincent Chio Date: 08/11/2015 District-Co-Route: 07-LA-138								
PΝ	: <u>0.0/36.8</u> Project ID (or EA): <u>EA 265100</u> RWQCB: <u>Lahontan an</u>	nd Los Ang	eles						
Pre	eservation of Existing Vegetation								
 Review Preservation of Property, (Clearing and Grubbing) to reduce clearing and grubbing and maximize preservation of existing vegetation. 									
2.	Has all vegetation to be retained been coordinated with Environmental, and identified and defined in the contract plans?	∐Yes	□No						
3.	Have steps been taken to minimize disturbed areas, such as locating temporary roadways to avoid stands of trees and shrubs and to follow existing contours to reduce cutting and filling?	Com	ıplete						
4.	Have impacts to preserved vegetation been considered while work is occurring in disturbed areas?	∐Yes	□No						
5.	Are all areas to be preserved delineated on the plans?	□Yes	□No						

	Treatment BMPs									
	Checklist T-1, Part 1									
Pre	pared by:_	Vince	nt Chio	Date:_	08/11/2015	District-Co-Route:	07-LA-13	8		
PM	: 0.0/36	.8	Project ID	(or EA):	EA 265100	RWQCB: Lahontan	and Los Ang	geles		
Со	nsideratio	n of Tre	eatment Bl	MPs						
det Do cor	This checklist is used for projects that require the consideration of Approved Treatment BMPs, as determined from the process described in Section 4 (Project Treatment Consideration) and the Evaluation Documentation Form (EDF). This checklist will be used to determine which Treatment BMPs should be considered for each watershed and sub-watershed within the project. Supplemental data will be needed to verify siting and design applicability for final incorporation into a project.									
res	ponses to	the que	estions as t	he basis wh	en developing	en considering Treatm the narrative in Section been appropriately o	on 5 of the	Storm		
					cted. Questio	ns 14 through 16 shou his checklist.	uld be ansv	vered		
1.	in an adop purpose fa	ted TMI acility re	DL impleme quirement (e	ntation plan c e.g. flood con	or does the proj trol and water o	ment BMP requirements ect have a dual quality treatment or and treatment)?	S ☐Yes	⊠No		
	whether the	ne T-1 cl ibed BM	necklist show IPs may not	uld be used to be feasible o	o propose alter or other BMPs r	ator to determine native BMPs because may be more cost- e may be necessary.				
2.	Dry Weath	ner Flow	Diversion							
	(a) Are dr	y weath	er flows ger	erated by Ca	ıltrans anticipat	ed to be persistent?	∐Yes	⊠No		
	(b) Is a sa	anitary s	ewer locate	d on or near t	the site?		∐Yes	⊠No		
	If Yes to be	oth 2 (a)	and (b), co	ntinue to (c).	If No to either	skip to question 3.				
			to the sanita		sible without ex	ktraordinary plumbing,	∐Yes	□No		
	(d) Is the	domesti	c wastewate	er treatment a	authority willing	to accept flow?	∐Yes	□No		
				hese question th Part 3 of the		y Weather Flow				
3.	Is the rece for litter/tra		ater on the 3	603(d) list for	litter/trash or ha	as a TMDL been issued	∐Yes	⊠No		
	Caltra	ne Stori	m Water Ou	ality Handbo	noke					

If Yes, consider Gross Solids Removal Devices (GSRDs). Complete and attach Part 6 of this checklist. Note: Infiltration Devices, Detention Devices, Media Filters, MCTTs, and Wet Basins also can capture litter. Before considering GSRDs for stand-alone installation or in sequence with other BMPs, consult with District/Regional NPDES Storm Water Coordinator to determine whether Infiltration Devices, Detention Devices, Media Filters, MCTTs, and Wet Basins should be considered instead of GSRDs to meet litter/trash TMDL. 4. Is the project located in an area (e.g., mountain regions) where traction sand is \square No Yes applied more than twice a year? If Yes, consider Traction Sand Traps Complete and attach Part 7 of this checklist. 5. Maximizing Biofiltration Strips and Swales Objectives: 1) Quantify infiltration from biofiltration alone 2) Identify highly infiltrating biofiltration (i.e. > 90%) and skip further BMP consideration. 3) Identify whether amendments can substantially improve infiltration. (a) Have biofiltration strips and swales been designed for runoff from all project \boxtimes No Yes areas, including sheet flow and concentrated flow conveyance? If no, document justification in Section 5 of the SWDR. (b) Based on existing site conditions, estimate what percentage of the WQV1 can be infiltrated. When calculating the WQV, use a drawdown time appropriate for the site conditions. ___ < 20% Complete ___ 20 % - 50% 50% - 90% ___ > 90% (c) Is infiltration greater than 90 percent? If Yes, skip to question 13. ∏No Yes If No, Continue to 5 (d). ¹ A complete methodology for determining WQV infiltration is available at: http://www.dot.ca.gov/hq/oppd/stormwtr/index.htm



	(d) Can the infiltration ranking in question 5(b) above be increased by using soil amendments?.	∐Yes	□No
	If Yes, consider including soil amendments (increasing the infiltration ranking of strips and swales shows performance comparable to other BMPs). Record the new infiltration estimate below. If No, continue to 5 (e).		
	< 20% (skip to 6)		
	20 % - 50% (skip to 6)		
	50% - 90% (skip to 6)		
	>90%	∐Con	nplete
	(e) Is infiltration greater than 90 percent? If Yes, skip to question 13. If No, continue to 5 (f).	∐Yes	□No
	(f) Is infiltration greater than 50 percent and is biofiltration preferred? If yes to both, skip to question 13.	∐Yes	□No
6.	Biofiltration in Rural Areas		
	Is the project in a rural area (outside of urban areas that is covered under an NPDES Municipal Stormwater Permit ¹)? If Yes, proceed to question 13.	∐Yes	□No
7.	Estimating Infiltration for BMP Combinations		
	Objectives:		
	Identify high-infiltration biofiltration or biofiltration and infiltration BMP combinations and skip further BMP consideration.		
	2) If high infiltration is infeasible, then identify the infiltration level of all feasible BMP combinations for use in the subsequent BMP selection matrices.		
	(a) Has concentrated infiltration (i.e., via earthen basins) been prohibited? Consult your District/Regional Storm Water Coordinator and/or environmental documents.	∐Yes	□No
	If No, continue to 7 (b); if Yes, skip to question 8 and do not consider earthen basin-type BMPs		

¹ See pages 39 and 40 of the Fact Sheets for the CGP. http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/constpermits/wqo_2009_0009_factsheet.pdf

	(b) Can the infiltration ranking be increased by infiltrating the un-infiltrated remaining WQV from question 5, with an infiltration BMP¹? If yes, record the new infiltration estimate below. If no, proceed to 7(c).	□Yes	□No
	< 20% (do not consider this BMP combination) 20% - 50% 50% - 90% >90%		
	Is at least 90 percent infiltration estimated? If Yes, proceed to 13. If No, proceed to 7(c).	□Yes	□No
	(c) Assess infiltration of biofiltration combined with an approved earthen BMP. This assessment will be used in subsequent BMP selection matrices.		
	Earthen Detention Basin		
	< 20% 20% - 50% > 50 %	□Comp	olete
	Continue to Question 8		
8.	Identifying BMPs based on the Target Design Constituents		
	(a) Does the project discharge to a 303(d) impaired water body or a water body that has a TMDL adopted? If "No," use Matrix A to select BMPs, consider designing to treat 100% of the WQV, then skip to question 12.If Yes, is the identified pollutant(s) considered a Targeted Design Constituent (TDC) (check all that apply below)?	⊠Yes	∏No
	☐ sediments ☐ copper (dissolved or total) ☐ phosphorus ☐ lead (dissolved or total) ☐ nitrogen ☐ zinc (dissolved or total) ☐ general metals (dissolved or total)²		
	(b) Treating Sediment. Is sediment a TDC? If Yes, use Matrix A to select BMPs, then skip to question 12. Otherwise, proceed to question 9.	∐Yes	⊠No

² General metals is a designation used by Regional Water Boards when specific metals have not yet been identified as causing the impairment.



¹ Assess the combined infiltration of the WQV by both biofiltration and infiltration BMPs. As site constraints allow, size the infiltration BMP up to the un-infiltrated WQV remaining after the biofiltration BMP.

BMP Selection Matrix A: General Purpose Pollutant Removal

Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.

	ВМГ	BMP ranking for infiltration category:									
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%								
Tier 1	Strip: HRT > 5 Austin filter (concrete) Austin filter (earthen) Delaware filter MCTT Wet basin	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* Biofiltration Strip	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* Biofiltration Strip Biofiltration Swale								
Tier 2	Strip: HRT < 5 Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Swale MCTT Wet basin	Austin filter (concrete) Delaware filter MCTT Wet basin								

HRT = hydraulic residence time (min)

*Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.

9.	Treating both Metals and Nutrients. Is copper, lead, zinc, or general metals <i>AND</i> nitrogen or phosphorous a TDC? If Yes, use Matrix D to select BMPs, then skip to question 12. Otherwise, proceed to question 10.	∐Yes	⊠No
10.	Treating Only Metals.		
	Are copper, lead, zinc, or general metals listed TDCs? If Yes, use Matrix B below	∏Yes	⊠No

to select BMPs, and skip to question 12. Otherwise, proceed to question 11.

BMP Selection Matrix B: Any metal is the TDC, but not nitrogen or phosphorous

Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.

	ВМЕ	ranking for infiltration cated	jory:			
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%			
Tier 1	MCTT Wet basin Austin filter (earthen) Austin filter (concrete) Delaware filter	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* MCTT Wet basin	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* MCTT Biofiltration Strip Biofiltration Swale Wet basin			
Tier 2	Strip: HRT > 5 Strip: HRT < 5 Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale	Austin filter (concrete) Delaware filter			

HRT = hydraulic residence time (min)

11. Treating Only Nutrients.

Are nitrogen and/or phosphorus listed TDCs? If "Yes," use Matrix C to select BMPs. If "No", please check your answer to 8(a). At this point one of the matrices Should have been used for BMP selection for the TDC in question, unless no BMPs are feasible.

^{*}Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.

BMP Selection Matrix C: Phosphorous and / or nitrogen is the TDC, but no metals are the TDC

Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.

	BMP ranking for infiltration category:									
	Infiltration < 20%	Infiltration > 50%								
Tier 1	Austin filter (earthen) Austin filter (concrete) Delaware filter**	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches*	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* Biofiltration Strip Biofiltration Swale							
Tier 2	Wet basin Biofiltration Strip Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale Wet basin	Austin filter (concrete) Delaware filter Wet basin							

^{*} Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.

^{**} Delaware filters would be ranked in Tier 2 if the TDC is nitrogen only, as opposed to phosphorous only or both nitrogen and phosphorous.

BMP Selection Matrix D: Any metal, plus phosphorous and / or nitrogen are the TDCs

Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.

	ВМГ	ranking for infiltration cated	jory:
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%
Tier 1	Wet basin* Austin filter (earthen) Austin filter (concrete) Delaware filter**	Wet basin* Austin filter (earthen) Detention (unlined) Infiltration basins*** Infiltration trenches***	Wet basin* Austin filter (earthen) Detention (unlined) Infiltration basins*** Infiltration trenches*** Biofiltration Strip Biofiltration Swale
Tier 2	Biofiltration Strip Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale	Austin filter (concrete) Delaware filter

^{*} The wet basin should only be considered for phosphorus

^{**} In cases where earthen BMPs can infiltrate, Delaware filters are ranked in Tier 2 if the TDC is nitrogen only, but they are Tier 1 for phosphorous only or both nitrogen and phosphorous.

^{***} Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.

12.	Does the project discharge to a 303(d) waterbody that is listed for mercury or low dissolved oxygen?	⊠Yes	□No
	If Yes, contact the District/Regional NPDES Storm Water Coordinator to determine if standing water in a Delaware filter, wet basin, or MCTT would be a risk to downstream water quality.		
13.	After completing the above, identify and attach the checklists shown below for every Treatment BMP under consideration. (use one checklist every time the BMP is considered for a different drainage within the project)	⊠Cor	mplete
14.	Estimate what percentage of the net WQV (for all new impervious surfaces within the project) or WQF (depending upon the Treatment BMP selected) will be treated by the preferred Treatment BMP(s): 85% (Alternative 1) *	⊠Cor	mplete
15.	Estimate what percentage of the net WQV (for all new impervious surfaces within the project) that will be infiltrated by the preferred treatment BMP(s):100%**	⊠Cor	mplete
16.	Prepare cost estimate, including right-of-way, and site specific determination of feasibility (Section 2.4.2.1) for selected Treatment BMPs and include as supplemental information for SWDR approval.	⊠Cor	mplete
*No	ote: The amount of treatment should be calculated for each BMP and each subwatershed, unless all BMPs within a project are the same. Document in SWDR.		
**N	ote: The Water Quality Volume infiltrated should be documented for the entire project and also for each subwatershed. Document in SWDR.		

Complete

Treatment BMPs Checklist T-1, Part 4 Prepared by: Vincent Chio Date:__08/11/2015 District-Co-Route: 07-LA-138 EA 265100 PM: 0.0/36.8 Project ID (or EA): RWQCB: Lahontan and Los Angeles Infiltration Devices **Feasibility** 1. Does local Basin Plan or other local ordinance provide influent limits on quality of ∏Yes \bowtie No water that can be infiltrated, and would infiltration pose a threat to groundwater quality? 2. Does infiltration at the site compromise the integrity of any slopes in the area? \bowtie No Yes 3. Per survey data or U.S. Geological Survey (USGS) Quad Map, are existing slopes \square No l |Yes at the proposed device site >15%? 4. At the invert, does the soil type classify as NRCS Hydrologic Soil Group (HSG) \bowtie No □Yes D, or does the soil have an infiltration rate < 0.5 inches/hr? For Design Pollution Prevention BMPs, can the soil be amended to provide an adequate infiltration rate and void space. 5. Is site located over a previously identified contaminated groundwater plume? ∏Yes \bowtie No If "Yes" to any question above, Infiltration Devices are not feasible; stop here and consider other approved Treatment BMPs. 6. (a) Does site have groundwater within 10 ft of basin invert? □Yes \bowtie No (b) Does site investigation indicate that the infiltration rate is significantly greater ∏Yes \bowtie No than 2.5 inches/hr? If "Yes" to either part of Question 6, the RWQCB must be consulted, and the RWQCB must conclude that the groundwater quality will not be compromised, before approving the site for infiltration. 7. Does adequate area exist within the right-of-way to place Infiltration Device(s)? ⊠Yes No If "Yes", continue to Design Elements sections. If "No", continue to Question 8. 8. If adequate area does not exist within right-of-way, can suitable, additional right-∏Yes □No of-way be acquired to site Infiltration Devices and how much right-of-way would be needed to treat WQV? acres If Yes, continue to Design Elements section.

9. If adequate area cannot be obtained, document in Section 5 of the SWDR that

the inability to obtain adequate area prevents the incorporation of this Treatment

If No, continue to Question 9.

BMP into the project.

Design Elements - Infiltration Basin

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

	Recommended Design Element – A "Yes" response is preferred for these questions, but not reproration into a project design.	equired for	
1.	Has a detailed investigation been conducted, including subsurface soil investigation, in-hole conductivity testing and groundwater elevation determination? (This report must be completed for PS&E level design.) *	∐Yes	□No
2.	Has an overflow spillway with scour protection been provided? *	□Yes	□No
3.	Is the Infiltration Basin size sufficient to capture the WQV while maintaining a 40-48 hour drawdown time? If the BMP is used in series with a biofiltration device, then does the total upstream infiltration plus the Infiltration Basin volume at least equal the WQV. *	∐Yes	□No
4.	Can access be placed to the invert of the Infiltration Basin? *	Yes	□No
5.	Can the Infiltration Basin accommodate the freeboard above the overflow event elevation (reference Appendix B.1.3.1)? *	∐Yes	□No
6.	Can the Infiltration Basin be designed with interior side slopes no steeper than 4:1 (h:v) (may be 3:1 [h:v] with approval by District Maintenance)? *	□Yes	□No
7.	Can vegetation be established in the Infiltration Basin? **	∐Yes	□No
8.	Can diversion be designed, constructed, and maintained to bypass flows exceeding the WQV? **	□Yes	□No
9.	Can a gravity-fed Maintenance Drain be placed? **	∐Yes	□No
<u>De</u>	sign Elements – Infiltration Trench		
1.	Has a detailed investigation been conducted, including subsurface soil investigation, in-hole conductivity testing and groundwater elevation determination? (This report must be completed for PS&E level design.) *	∐Yes	⊠No
2.	Is the surrounding soil within Hydrologic Soil Groups (HSG) Types A or B? **	⊠Yes	□No
3.	Since this BMP is used in series with a pretreatment (see No. 7 below), then does the total upstream infiltration by the pretreatment plus the void space volume of the Infiltration Trench at least equal the WQV, while maintaining a drawdown time of \leq 72 hours? **	∐Yes	□No
4.	Is the depth of the Infiltration Trench \leq 13 ft? *	⊠Yes	□No
5.	Can an observation well be placed in the trench? **	Yes	□No
6.	Can access be provided to the Infiltration Trench? *	⊠Yes	□No
7.	Can pretreatment be provided to capture sediment in the runoff (such as using vegetation)? *	□Yes	□No
8.	Can flow diversion be designed, constructed, and maintained to bypass flows exceeding the Water Quality event? **	⊠Yes	□No

9.	Can a perimeter curb or similar device be provided (to limit wheel loads upon the trench)? **	⊠Yes	□No
<u>De</u>	<u>sign Elements and Feasibility – Infiltration-DPP BMPs</u>		
* R	equired Design Element – (see definition above)		
** F	Recommended Design Element – (see definition above)		
1.	Has a detailed soil investigation been conducted, to assure stability of the slope? **	Yes	\boxtimes No
2.	Does the soil have adequate infiltration rates or can the soil be amended to increase its infiltrating properties? **	⊠Yes	□No
3.	Are flow velocities from a peak drainage facility design event < 4 fps (i.e. low enough to prevent scour or erosion of DPP (swale or conveyance) as per HDM Table 873.3E)? Or has the BMP been designed to prevent scour or erosion for higher velocities (e.g. rock lined ditch). *	⊠Yes	□No

	Treatment BMPs												
	Checklist T-1, Part 7												
Pre	pared by: Vincent	Chio Dat	e: <u>02</u>	/27/2015	District-Co-F	Route:	07-LA-138	3					
PΝ	: 0.0/36.8	_Project ID (or EA):_	E <i>P</i>	<u> 265100</u>	RWQCB: <u>La</u>	ahontan ar	nd Los Ang	geles					
Tra	nction Sand Traps												
<u>Fe</u>	<u>asibility</u>												
1.	 Can a Detention Device be sized to capture the estimated traction sand and the WQV from the tributary area? If Yes, then a separate Traction Sand Trap may not be necessary. Coordinate with the District/Regional Design Storm Water Coordinator and also complete Checklist T-1, Part 5. 												
2.	Is the Traction Sand enhancing substance						∐Yes	□No					
3.	Is adequate space p annual cleanout?	provided for Mainten	ance st	aff and equ	ipment access	for	∐Yes	□No					
	If the answer to any not feasible.	one of Questions 2	or 3 is I	No, then a	Traction Sand ⁻	Гrap is	□Yes	∏No					
4.	Does adequate area If Yes, continue to	a exist within the righ Design Elements se											
5.	If adequate area doo of-way be acquired to be needed? If Yes, continue to	•	Traps	and how m	nuch right-of-wa	ay would	∐Yes	□No					
6.	If adequate area car the inability to obtain						☐Com	plete					

BMP into the project.

Design Elements

** (CMP type)

* Required Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design. ** Recommended Design Element – A "Yes" response is preferred for these guestions, but not required for incorporation into a project design. 1. Was the local Caltrans Maintenance Station contracted to provide the amount of ∏Yes □No traction sand used annually at the location? * (Detention Device or CMP type) List application rate reported. 2. Does the Traction Sand Trap have enough volume to store settled sand over the ∏Yes ∏No winter using the formula presented in Appendix B, Section B.5? * (Detention Device or CMP type) 3. Is the invert of the Traction Sand Trap a minimum of 3 ft above seasonally high □Yes No groundwater? * (CMP type) 4. Is the maximum depth of the storage within 10 ft of the ground surface, or □Yes □No another depth as required by District Maintenance? * (CMP type) 5. Can peak flow be diverted around the device? ** (CMP type) ∏Yes □No 6. Can peak flow be diverted around the device? ** (CMP type) □No ∏Yes 7. Is 6 inches separation provided between the top of the captured traction sand ∏Yes No and the outlet from the device, in order to minimize re-suspension of the solids?

Deviation of BMPs from the Corridor Study Recommendation (supplemental attachment to SWDR)

Date: 9/24/2015

District-County-Route: 07-LA-138

EA 265100

SWDR Phase: PA/ED

Treatment BMPs Recommended by the			Proposed Treatment BMPs outlined in the Storm Water Data Report (SWDR)							ort (SWDI	R)	Watershed	Comments	
Cor	ridor Storm Water Mar	nagemen	t Study										1	
Site	BMP Type	Paved	Unpaved	Site	County	Route	Post	Dir	BMP Type	Paved	Unpaved	Total		
No.		Tributa	Tributary	No.			mile			Tributary	Tributary	Area		
		ry Area	Area							Area	Area	treated		
		(acres)	(Acres)							treated	(Acres)	(Acres)		
										(acres)				
91A	Biofiltration Swale	0.94	1.88	91A	LA	I-5	80.78	NB/SB	Biofiltration Swale	0.66	0.03	0.69	DA3	
93	Infiltration Device	1.94	0.94	93	LA	I-5	80.85	NB/SB	Infiltration Device	1.30	0.10	1.40	DA3A	
91B	Biofiltration Swale	0.31	1.00	91B	LA	I-5	81.02	NB/SB	Biofiltration Swale	1.24	0.06	1.30	DA4A	
91C	Biofiltration Swale	1.80	1.25	91C	LA	I-5	81.28	NB/SB	Biofiltration Swale	0.60	1.40	2.00	DA9	
103B	Biofiltration Swale	1.68	1.14	103B	LA	I-5	81.93	NB/SB	Biofiltration Swale	1.08	2.52	3.60	DA10	
106A	Biofiltration Swale	1.53	2.47	106A	LA	I-5	82.37	NB/SB	Biofiltration Swale	1.10	1.10	2.20	DA12	
107A	Biofiltration Swale	0.81	0.61	107A	LA	I-5	82.55	NB/SB	Biofiltration Swale	0.75	0.75	1.50	DA17	
17	Biofiltration Swale	0.94	1.17	17	LA	SR-138	0.76	WB	Biofiltration Swale	1.04	0.26	1.30	N/A	
19	Biofiltration Swale	1.15	0.53	19	LA	SR-138	0.87	EB	Biofiltration Swale	0.23	0.22	0.45	PA1	
20	Biofiltration Swale	0.88	0.51	20	LA	SR-138	0.88	EB	Biofiltration Swale	0.84	0.04	0.88	PA1	
25	Biofiltration Swale	0.46	0.14	25	LA	SR-138	1.25	EB	Biofiltration Swale	0.27	1.13	1.40	PA3B	
24	Biofiltration Strip	1.32	2.05	24	LA	SR-138	1.43	WB	Biofiltration Strip	0.70	0.20	0.90	PA3B	
27	Biofiltration Swale	0.97	0.03	27	LA	SR-138	1.70	EB	Biofiltration Swale	0.68	1.02	1.70	PA10	
28	Biofiltration Strip	0.55	0.49	28	LA	SR-138	1.71	WB	Biofiltration Strip	0.68	1.02	1.70	PA10	
29 31	Biofiltration Swale Biofiltration Swale	1.25 0.56	1.61	29	LA	SR-138	1.84	EB/WB	Biofiltration Swale	0.90	0.60	1.50	PA9A	Not compatible with proposed project condition
32	Biofiltration Swale	0.56	0.15											Not compatible with proposed project condition Not compatible with proposed project condition
751	Biofiltration Swale	1.33	3.58											Outside project impact limits
87	Biofiltration Swale	0.44	0.52											Outside project impact limits
88A	GSRD Inclined Screen		.63											Outside project impact limits and existing ROW. Does not treat pollutant of concern.
88B	GSRD Inclined Screen		.62											Outside project impact limits and existing ROW. Does not treat pollutant of concern.
88C	GSRD Inclined Screen		.12											Outside project impact limits and existing ROW. Does not treat pollutant of concern.
95	Biofiltration Swale	1.83	2.35											Outside project impact limits
98	Biofiltration Swale	0.29	0.45											Outside project impact limits
99	Biofiltration Swale	1.03	1.68											Outside project impact limits and existing ROW
103A	Biofiltration Swale	0.33	0.94											Outside project impact limits
101	Biofiltration Swale	0.63	2.30											Outside project impact limits and existing ROW
		2	.30											Outside project impact limits and existing ROW. Project area does not have trash/litter as pollutant of
101	GSRD Linear Radial													concern.
		2	.24										1	Outside project impact limits and existing ROW. Project area does not have trash/litter as pollutant of
102	GSRD Inclined Screen													concern.
102	Biofiltration Swale	0.68	0.99											Outside project impact limits and existing ROW
105	Biofiltration Swale	0.42	0.64										1	Outside project impact limits
106B	Biofiltration Swale	1.31	2.14										1	Treatment provided by 106A
107C 109	Biofiltration Swale Biofiltration Swale	1.43	3.32										1	Outside project impact limits
110	Biofiltration Swale Biofiltration Swale	0.69	0.75										-	Outside project impact limits Outside project impact limits
110	Biofiltration Swale Biofiltration Swale	0.87	0.94										-	Outside project impact limits Outside project impact limits
1	GSRD Linear Radial		0.85										1	Outside project impact limits Outside project impact limits and does not treat pollutant of concern
_ '	GOND LITIEAL RAUIAI		.03	I							l		1	Outside project impact innits and does not treat poliutant of concern

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Deviation of BMPs from the Corridor Study Recommendation (supplemental attachment to SWDR)

Date:	9/24/2015
District-County-Route:	07-LA-138
EA	265100
SWDR Phase:	PA/ED

Treatment BMPs Recommended by the				Propose	ed Treatme	ent BMPs	outline	d in the Storm Water	Data Repo	rt (SWDF	R)	Watershed	Comments
Co	rridor Storm Water Mai	nagement Study											
Site	BMP Type	Paved Unpaved	Site	County	Route	Post	Dir	BMP Type	Paved	Unpaved	Total	Ī	
No.		Tributa Tributary	No.			mile			Tributary	Tributary	Area		
		ry Area Area							Area	Area	treated		
		(acres) (Acres)							treated	(Acres)	(Acres)		
									(acres)				
2	Infiltration Device	1.32 1.75											Outside project impact limits
	0000 1 11 10	1.30											
3	GSRD Inclined Screen												Outside project impact limits. Project area does not have trash/litter as pollutant of concern.
	000011 0 111	0.92											Outside project impact limits and existing ROW. Project area does not have trash/litter as pollutant of
4	GSRD Linear Radial												concern.
4	Biofiltration Swale	0.77 0.92											Outside project impact limits and existing ROW
5	Biofiltration Strip	0.32 0.46											Outside project impact limits
6	Biofiltration Swale	0.53 0.93											Outside project impact limits
23	GSRD Inclined Screen	0.83											Project area does not have trash/litter as pollutant of concern.
7	Biofiltration Swale	0.54 1.42											Outside project impact limits
9	GSRD Linear Radial	0.79											Outside project impact limits. Project area does not have trash/litter as pollutant of concern.
9	GSKD LITIEAL KAUIAI	1.70											Outside project impact innits. Project area does not have trasit/litter as polititant of concern.
10	GSRD Inclined Screen	1.70											Outside project impact limits. Project area does not have trash/litter as pollutant of concern.
11	Biofiltration Swale	0.54 1.96											Outside project impact limits
12	Biofiltration Swale	0.21 0.32											Outside project impact limits
		0.59											
13	GSRD Inclined Screen												Outside project impact limits. Project area does not have trash/litter as pollutant of concern.
14	Biofiltration Swale	0.96 2.51											Outside project impact limits
15	Biofiltration Swale	0.34 1.14											Outside project impact limits
22	GSRD Inclined Screen	0.98											Project area does not have trash/litter as pollutant of concern.
26	Biofiltration Strip	1.18 2.03											Not compatible with proposed project condition
			Note: A	Additiona	al BMPs wi	ll be imple	mented o	n SR-138. The BMPs v	vill treat a tot	al of 349 ac	cres of im	pervious area	a.
		33.64 34.89							12.07	10.45	22.52		

Note: water quality volume (WQV) = (Acres) X (43560) X (0.75 inch/12)

I have reviewed and concur with the contents of the above table.

Print name: Signature: Date:

Timothy H Tieu, District 7 Corridor Study Manager or designated representative (signature required at PS&E only)

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